In This Issue—*The Indianapolis Race*

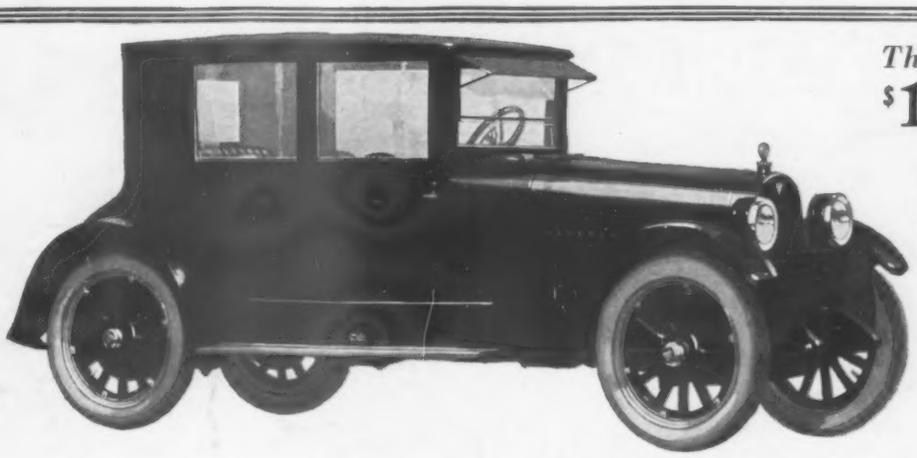
MOTOR AGE

VOL. XLI
Number 22

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, JUNE 1, 1922

Thirty-five Cents a Copy
Three Dollars a Year

HUDSON



The Coach
$1795

At the Height of Success We Adopt a New Motor

No car ever had a more famous motor than the Super-Six. More than 125,000 owners know its performance. Its reliability in long, hard service is outstanding.

Then how great is the new motor to warrant a change at this time.

Dealers Cash in on This Sensation

Hudson dealers everywhere are making money. Already they have waiting lists. The coach type—developed by Hudson engineers—a beautiful closed car costing less than 6% above open models, is the biggest seller in years.

Now is added the new Hudson motor. It is a revelation even to Hudson owners. It has added tremendously to the interest and selling power of the Hudson Super-Six.

If you are interested in a franchise write today.

No Advance in Prices

HUDSON SUPER SIX

Phaeton	$1695
7-Pass. Phaeton	1745
Cabriolet	2295
Coupe	2570
Sedan	2650
Tour. Limousine	2920
Limousine	3495

Freight and tax extra

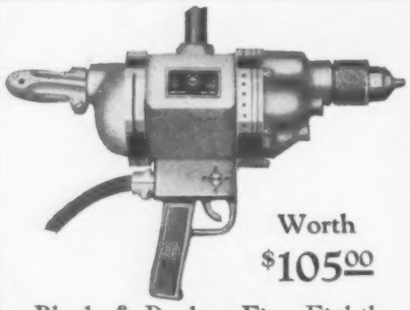
A Ride tells all

HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN

(11-23)

Entered as second class matter Sept. 19, 1899, at the post office at Chicago, Ill., under Act of Mar. 3, 1879

BLACK & DECKER PRIZE CONTEST

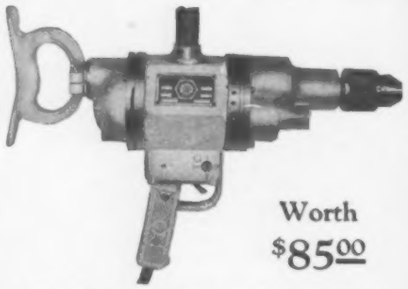


Worth $105.00

Black & Decker Five-Eighths Inch Portable Electric Drill

"With the Pistol Grip and Trigger Switch"

1st PRIZE



Worth $85.00

Black & Decker Special Half Inch Portable Electric Drill

"With the Pistol Grip and Trigger Switch"

2nd PRIZE

Worth $39.00

Black & Decker Light Quarter Inch Portable Electric Drill

"With the Pistol Grip and Trigger Switch"

3rd PRIZE

THREE prizes as shown opposite will be given for the greatest number of holes which have to be drilled in auto and truck repair work:

WE SELL HOLES

but we don't know how many different kinds we do sell. To get a complete list we are asking the men who do repair work to send us a list of all the holes they have to drill. To make it worth while we offer the following prizes for the three most complete lists.

RULES OF CONTEST

1. Only bona fide repair shops are eligible.
2. List of holes must be submitted on the business letterhead of your repair shop.
3. Write in ink or on typewriter on one side of paper only.
4. It is not necessary to give sizes of holes, merely what they are drilled for.
5. Divide your list in two parts, one showing REPAIR JOBS for which holes must be drilled and the other showing ACCESSORIES and ATTACHMENTS for which holes must be drilled.
6. Contest will be judged on the basis of the greatest number of different kinds of jobs in the automotive repair shop requiring the drilling of holes.
7. If two or more are equally entitled to a prize in any class, each contestant will receive the full prize for that class.

EXAMPLE

HOLES FOR REPAIR JOBS

Lining up holes for attaching ring gears to differential.
Drilling out broken cylinder head studs.
Drilling frame for rivets.
And so forth.

HOLES FOR ATTACHMENTS

Parking Lights.
Cushion Accelerators.
Cutouts.
Bumpers.
Shock Absorbers.
And so forth.

"THE WELL EQUIPPED SHOP GETS THE BUSINESS"

CONTEST CLOSES JULY 1, 1922

Sit down and make out your list now and send it to

"CONTEST DEPARTMENT"

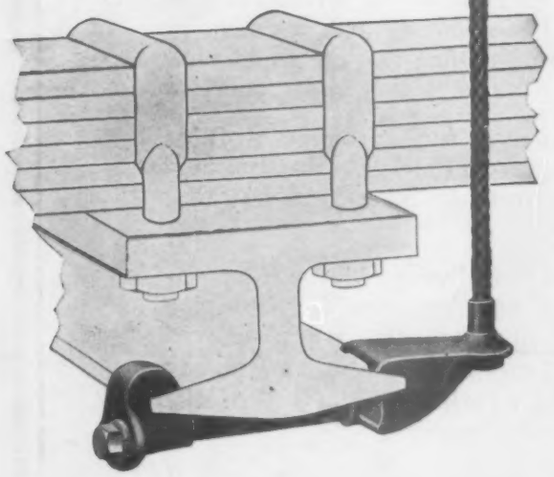
THE BLACK & DECKER MFG. CO.

Towson Heights, Baltimore, Md., U.S.A.

IT ACTS LIKE A BRAKE

Model C
$28
with complete fittings. For all cars up to 3000 lbs.

West of the Rockies
$30



In much the same manner that an automobile brake works, the

GILMAN SHOCK ABSORBER

performs its function, for it virtually brakes every recoiling movement, minute and great, of the automobile's springs, but with extreme smoothness.

The moment that the springs start back, after compressing, the Gilman takes control instantly. This control is in proportion to the force of the springs' recoil. It is interposed without abruptness or harshness. The natural function of the springs is performed normally, at all times, over all roads and the improvement in the car's riding qualities is most marked.

Aside from the real comfort the Gilman insures, its economic value is well worth while.

Let us send you a descriptive folder.

Model F
$14
for Ford touring, roadster, sedan or coupe

West of the Rockies
$15

GILMAN-DAVIS COMPANY

217 W. Superior St., CHICAGO, ILL.

SOME GOOD TERRITORY OPEN TO DISTRIBUTORS

Takes the kick from the recoil

TEMPLAR RUTHS

CONCENTRATED in the Metropolitan District of New York is 10% of the population of the entire United States.

To this great center of wealth and population comes the best of everything that the world produces—and from every state in the Union comes an ever-changing army of buyers to learn what the great metropolis has accepted.

Millions have been spent in futile attempts to force products upon the New York market. But the field of selection is too large to make New York buy that which is not good.

It is three years since the Morrow Motor Corporation at 1761 Broadway, first began selling Templar Motor Cars. Today, more Templars are being sold by this company than at any previous time. And the profoundest compliment of all is that 60% of the sales are to former Templar owners.

In the world's most congested traffic, in the heart of the world's greatest wealth, in the largest buying and selling market of all time, Templar has made good.

But this is not the whole proof of Templar's goodness. From New York to the land of the Golden Gate, Templar dealers are reporting increasing sales of America's Superfine Light Car.

THE co-operative plan upon which the new Templar franchise is based makes a partner of every dealer.

Appearance—Performance—Economy
Prove Templar's Quality

The Templar Motors Company

3100 Halstead Street **Cleveland, Ohio**

MOTOR AGE

Published Every Thursday by
THE CLASS JOURNAL COMPANY
MALLERS BUILDING
59 East Madison Street, CHICAGO

Vol. XLI Chicago, June 1, 1922. No 22

CONTENTS

Small Cars Win New Laurels in 500-Mile Race 9
By B. M. Ikert

Bulletin Board Story of the Race 12

Racing Experience Helps Designers Obtain Greater Power and Reliability 16
By Paul Dumas

New Body Offerings of Four Manufacturers 20

Are You a Dealer or a Broker? 23
By Clyde Jennings

Editorials

Can You Afford to be Without—Electrical Testings Devices? 26
Your Show Windows 26
The Association Spirit 27
Looking Ahead 27
A Need of Motor Organization 27

New of the Industry

Orders in Hand for a Big June 28
Good Prospects for June in 19 Cities of Illinois 28
Minnesota Expects 500,000 Tourists 29
May Better Than April in Chicago Automotive Industry 30
Recovery of Automobile Business Rapid in South 30
"Saturday Ain't No Day to Work" Slogan to Aid Sales 31
Used Car Business Vital to Industry, Says Dealer 31
Says Legislatures Are Chief Hindrance to Truck Progress 32
Grand Prix to Use American Track Methods 32
Firestone Operating Profit of $2,500,000 for 6 Months 33
Detroit Air-Cooled Car Scheduled for Production 33
Cleveland Factories and Dealers Prosperous 34
Cleveland Dealers Adopt New Association Program 34
Committee Named to Study Motor Vehicle Restrictions 35
How Freight Reduction Aids Automobile Business 35
Business Notes 36
Concerning Men You Know 37
In the Retail Field 38

The Readers' Clearing House

Advice on Doing Brake Relining as an Exclusive Business 39
Lighting on Buick D-45 39
Responsibility for Part Lost in Shipping 39
Building With View to Expanding Later 40
Ford Battery Installation Question 40
Changing Cadillac Electric System 41
Opinion and Law 41
Analysis of Connecticut Lighting Switch on 1917 Chevrolet 42
Starting Mechanism on 1919 Reo 43
When and How to Change Battery Electrolyte 44
High Rate Discharge Test for Storage Batteries 44
Installation of Ammeter on 1914 Moon 44
Full, Three-Quarter and Semi-Floating Axles Explained 45
Tuning a Paige for Speed 45
Micrometer Necessary for Accurate Workmanship 46
Instruments for Testing Condenser and Magneto Armature 46
Power Characteristics of Paige 46

The Accessory Show Case 47
Service Equipment 48
Coming Motor Events 49
Specifications of Current Truck Models 50
Specifications of Current Tractors 52
Specifications of Current Passenger Car Models 54

Index to Advertisers Next to Last Page.

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions	$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union	6.00 per year
Single Copies	35 cents

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.

MAKING PROFITS FOR DEALERS

Car owners know that carbon is responsible for 80% of their engine troubles. Thousands of people are keeping their motors clean with Johnson's Carbon Remover. This demand is creating profitable business for dealers who are prepared to supply it.

JOHNSON'S CARBON REMOVER

is a harmless liquid that contains no acid. It has no action on any metal and does not affect lubrication.

The use of Johnson's Carbon Remover every 500 miles keeps motors running quietly and full of "pep." A pint can will clean out a four cylinder motor twice. If necessary, the car owner can apply it himself.

You can make big profits and satisfied customers from a small investment in Johnson's Carbon Remover.

Write for our book on Keeping Cars Young—it's free. Tells how to reduce automobile depreciation with Johnson's Car Savers.

S. C. JOHNSON & SON
Racine, Dept. MA 6 Wisconsin

"I am thoroughly satisfied that we have in the Oldsmobile the finest selling proposition that there is in the market today. I do not know of any other line of automobiles in the city of Troy that I would swap the Oldsmobile contract for.

We delivered six new automobiles on Saturday and we are satisfied that the reason business is so good with us in the Oldsmobile line is, first, the success the Model 43-A has given in the hands of owners, second, the small cost of maintenance.

Selling automobiles this spring is not worrying us. We are going to make money on them."

Very truly yours,
OLDSMOBILE SALES AND SERVICE CO.
(Troy, N. Y.)
Q. H. Ball

Oldsmobile
24th YEAR

If There's An Oldsmobile Dealer In Your Town—
He Is Making Money Now—

His product is right

It is favorably known.

It comprises a complete line of 4's and 8's.

It has a wide, sensible price range from $1145 to $2635.

His franchise is right

His commissions are liberal.

He has the General Motors Extended Payment Plan to help him.

He is given real help from the factory.

His future is assured

Back of him is the Olds Motor Works which for 24 continuous years has manufactured automobiles.

And back of the company is the General Motors Corporation, the strongest in the automotive industry.

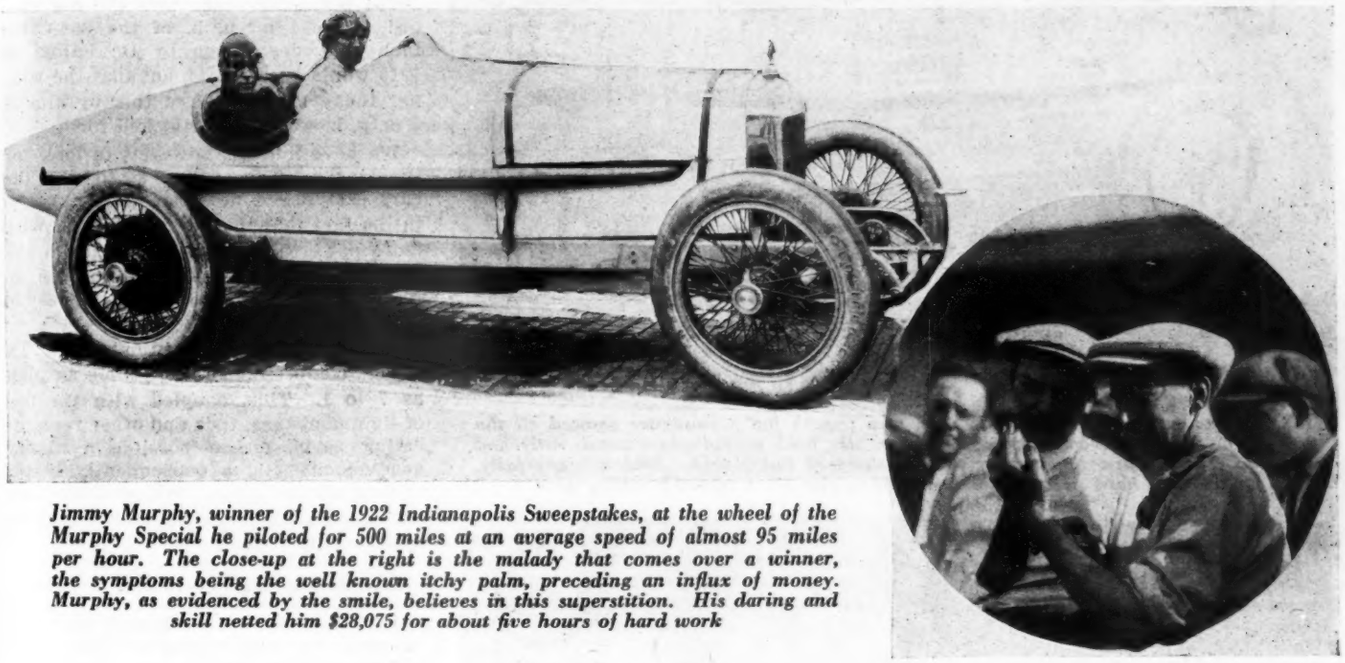
If some other far-seeing man isn't the Oldsmobile representative in your territory, why shouldn't it be you?

Write us today—we'll gladly give you information concerning your territory

OLDS MOTOR WORKS LANSING, MICHIGAN

Vol. XLI, No. 22 Chicago, June 1, 1922 $3 Per Year

MOTOR AGE



Jimmy Murphy, winner of the 1922 Indianapolis Sweepstakes, at the wheel of the Murphy Special he piloted for 500 miles at an average speed of almost 95 miles per hour. The close-up at the right is the malady that comes over a winner, the symptoms being the well known itchy palm, preceding an influx of money. Murphy, as evidenced by the smile, believes in this superstition. His daring and skill netted him $28,075 for about five hours of hard work

Small Cars Win New Laurels in 500-Mile Race

Five of the 183 Cu. In. Engines Break Record Made in 1915 With 300 In. Design—1922 Classic a Field Day for Straight Eights

By B. M. IKERT

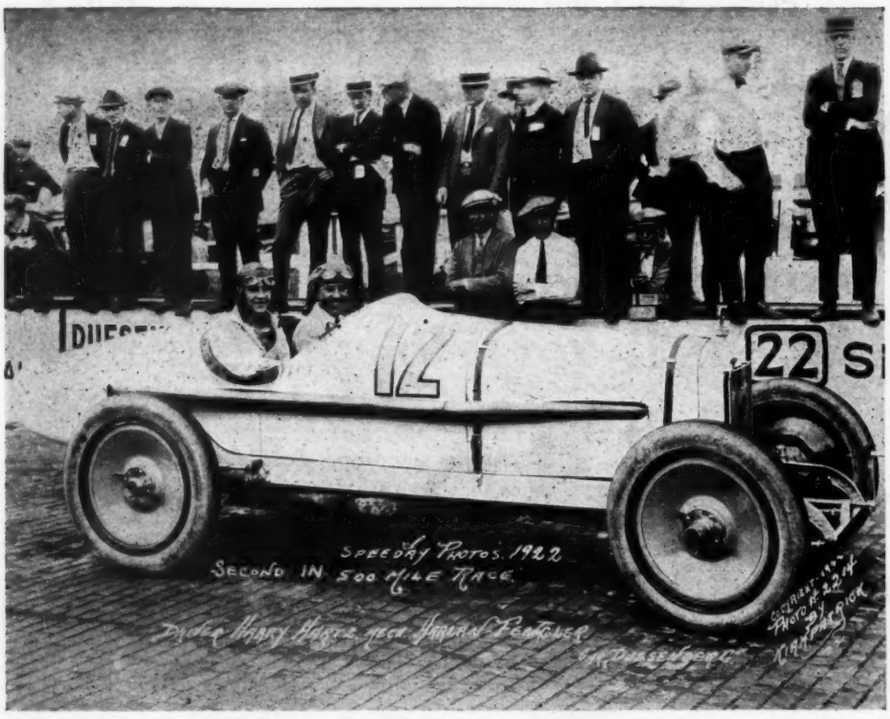
INDIANAPOLIS Speedway, May 30—Five cars broke the 500 mile Indianapolis race record established in 1915 by Ralph DePalma. The first eight cars to get the checkered flag were straight eights and of the first ten, seven were Duesenbergs. So it was a great day for the eights and the Duesenbergs, for while the car which Jimmy Murphy tooled around the brick oval in the record time of 5:17:30, which is at the rate of 94:48 m. p. h., was equipped with a Miller engine, the chassis was a Duesenberg.

The exponents of the four-cylinder engine did not fare so well as the eights, the only car equipped with this type of engine to finish in the money being the Monroe driven by Tom Alley, which he landed in ninth place.

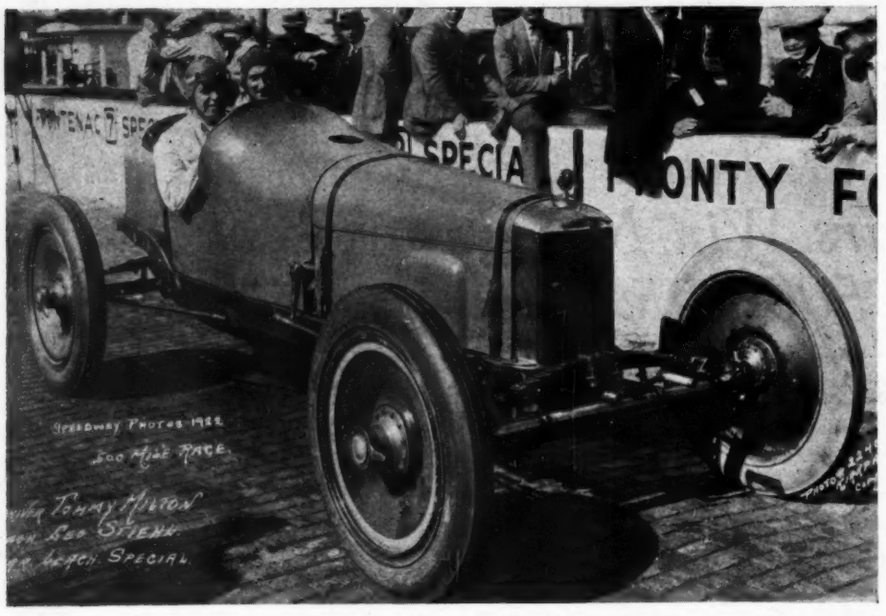
Judging from the list of entries it looked like a Duesenberg or Frontenac victory was in sight if force

What the Boys Got for Their Efforts

Driver	Car	M.P.H.	Prize
Murphy	Murphy-Special	94.48	$28,075
Hartz	Duesenberg	93.54	10,000
Hearne	Ballot	93.04	5,000
DePalma	Duesenberg	90.61	3,500
Haibe	Duesenberg	90.56	3,000
Wonderlich	Duesenberg	88.79	2,200
Fetterman	Duesenberg	87.99	1,800
Vail	Disteel-Duesenberg	85.69	1,600
Alley	Monroe-Special	83.89	1,500
Thomas	Duesenberg	82.19	1,400



Harry Hartz, runner-up in the 1922 race, who though but a youngster showed all the track generalship and cunning of a veteran. He held second place consistently and was ready at the first opportunity to take the lead but Murphy held it masterfully. It was this hard pursuit that made the leader set a record-breaking pace



Milton's car has a spring suspension which very closely resembles the Ford. Part of the fuel tank is carried underneath the car. This allows a low center of gravity of the fuel and keeps the center uniform as the fuel supply decreases

of numbers was a factor, inasmuch as there were eleven Frontenacs including the Fronty-Fords, and nine Duesenbergs. Of the Frontenacs Alley was the only man who finished in the money, the car being a Monroe and identical with the Frontenacs in many respects.

With the elimination in the 25th lap of Goux's Ballot and almost immediately after the start of the race of Wilcox's Peugeot, there was little competition left for the American cars, so far as the foreigners were concerned, with the exception of Hearne's Ballot, which finished third and about 5 minutes after Murphy had been given the flag.

It would be unfair to the foreign contingent, however, not to give a word of praise to the English Bentley Special, which, with the exception of a few details, was a stock car. The chassis had never been tried out until it reached the Hoosier track. This car ran very consistently, averaging about 80 m. p. h. and making no stops whatever. According to officials of this company the car has turned laps at Brooklands around 95 m. p. h. A partial explanation of the slower speeds is that the Indianapolis track curves require that the engine be shut off. Brookland's track has steeply banked turns.

183 In. Cars Break Past Record

When five cars break the record for all previous 500 mile races on this track, there naturally arises the why and wherefore of it all. It was generally conceded before the race that the old record of 89.84 m. p. h. of the 300-cubic inch Mercedes driven by De Palma in 1915 would be bettered, but that the winner today should exceed this by almost 5 m. p. h. was quite unlooked for.

We have not far, however, to look for the reason. The answer as to why the cars established new records today lies in the fact that they were equipped with more powerful engines, even though the piston displacement of the engines in today's cars was 183 cubic inches in piston displacement.

More power has been obtained by higher compression ratios, some as high as 7 to 1. This, coupled with the use of lighter pistons, rods and other reciprocating parts, makes possible a higher gas velocity and a consequently better cooling of the plugs. All of these factors being of utmost importance in high speed racing engines.

The Designers Learn as They Go

Also it must be remembered that our builders of racing engines and cars have had a year to develop and apply new designs and constructions in their creations. Many things were learned from last year's race, when Milton in a Frontenac almost equalled DePalma's old mark.

Both of the Fronty-Fords gave a good account of themselves and probably established firmly in the minds of dirt track drivers the fact that they are quite the thing for such work. While these little cars were hopelessly outclassed in speed by their larger brothers, they possessed almost uncanny staying powers and their clean cut exhaust spoke well for the special cylinder head which had been installed on the blocks. The cars had the usual Ford planetary transmissions and rear axle, although special steels were used in the axle shafts.

Milton's New Car

Milton had a new car of his own design in the race and while it was very fast was still too green in some ways to go through a 500 mile race. His car is novel in many respects, the most radical departure from usual racing practice being in the spring suspension. The front and rear springs are transverse semi-elliptic, resembling the conventional Ford spring layout. Radius rods take the drive. The car appears to have many possibilities, after a little more development work has been done. Milton's particular reason for withdrawing from the

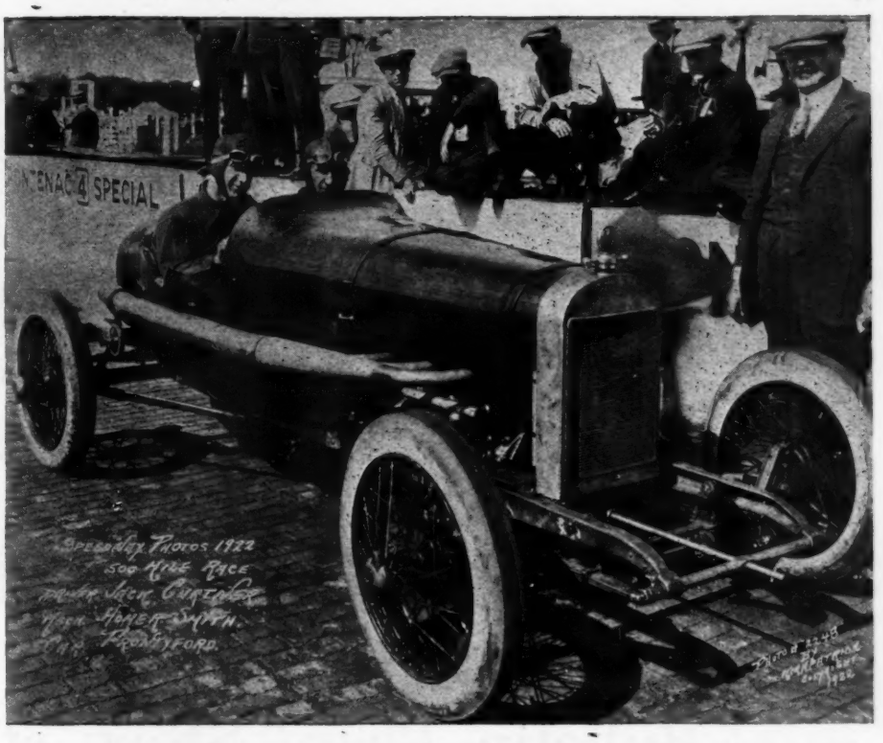
race today was on account of a loose fuel tank.

There were many pit stops, at which quite a few tires were changed. These were not due to the tires being damaged, but were done as a precautionary measure. Murphy made three pit stops, the first at the end of 187 miles, when he changed plugs, took on gas, water and oil and changed two tires. His last stop at 450 miles was for a right rear tire, which was changed in 25 seconds. This is a trifle over the record of 18 seconds for a wheel and tire change.

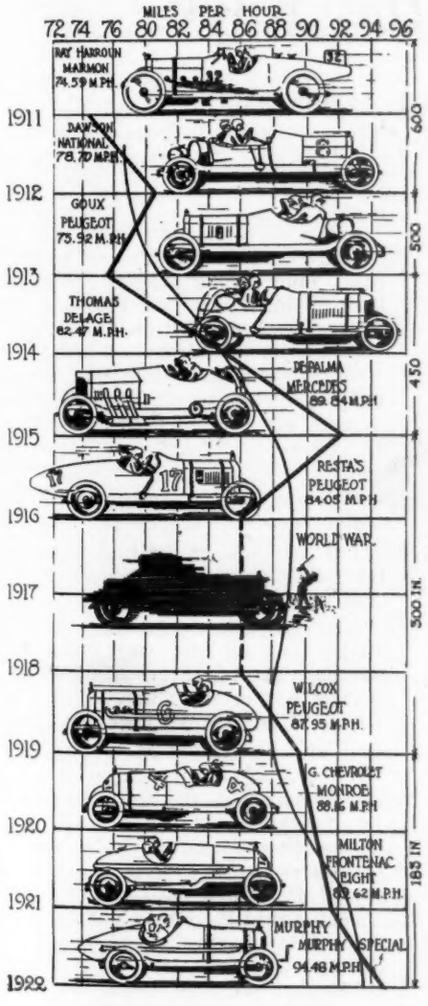
Young Drivers Make Good

Much of the glory of today's race goes to the youngsters who handled their mounts after a fashion of veterans of the gasoline circuit, when we consider that yesterday they were mechanicians. It was the first race in the capacity of driver, for Hartz and De Paolo. Last year they were mechanicians for Hearne and DePalma respectively.

Hartz was a good runner-up to the winner, finishing 3 min. and 14 sec. behind the leader. Hearne won the respect



One of the Fronty-Fords. They are equipped with regular Ford planetary transmission, axle, etc. The engine blocks are fitted with sixteen-valve heads. The front springs are semi-elliptic



A graphic presentation of the speed made in past Indianapolis races. Every few years the engines are made smaller but the speed curve has been consistently raised. Next year the limit will set at 122 cu. in.

of the crowd by his consistent driving of the Ballot. Wilcox's Peugeot had the old familiar roar to its exhaust and was looked upon by many as a serious contender. The irony of fate was seen today when Wilcox was the first contestant to be eliminated, his retirement coming in the seventh lap and caused by a broken valve spring. Last year he was the first man out of the race, then with a broken connecting rod, this also happening early in the race.

Murphy used plain wire wheels on the front of his car and disk covered wire wheels on the rear. Hartz used disk wheels all around. Many other cars were so equipped. There had been some discussion before the race regarding the safety of the disk wheels in a cross wind. The thought was that when the cars struck certain portions of the track exposed to openings between grandstands, they might side swipe from the action of a strong wind upon the wheels. However, there was little today to show that any element of danger was near from this cause.

The Last Race of the 183s

Incidentally the race today marked the exit of the 183 cu. in. engine from future 500-mile races. Next year's cars will be fitted with engines whose piston displacement shall not exceed 122 cu. in. or what corresponds to 2 litres in Europe. The 183 cu. in. engine was decided upon in 1920, after it was shown that the 300-cu. in. cars were getting too fast.

Whether next year's engines will equal the record hung up by Murphy today is a question. Men like Louis Chevrolet say it is possible. Past results of the race seem to bear this out when we consider that in 1911 Ray Harroun finished first in a car with an engine of 447 cu. in. piston displacement at the rate of 74.59 m. p. m., while Murphy with an engine in the 183 inch class traveled at the rate of 94.4 m. p. h. for the distance.

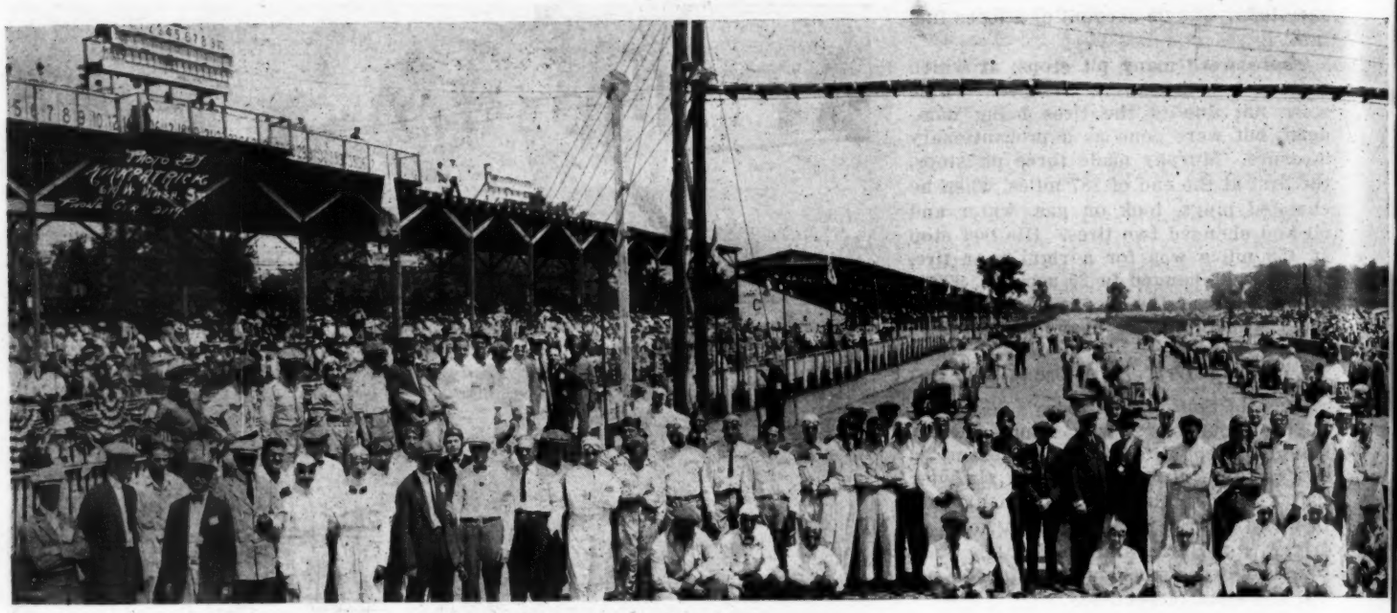
Smaller Engines, Greater Speed

Perhaps the new record will not be broken or even equalled next year by the 122 inch cars, but if development work is carried on as in the past, we can hope to see this done in 1924. By that time the engines and cars will have had the "bugs" taken out of them, just as many of the successful cars of today are the perfections of yesterday's efforts on the part of the builders.

The power output of an internal combustion engine is largely a matter of getting enough revolutions per minute. Therefore it follows that a small engine turning over fast will develop as much power as a large engine turning more slowly. The volume of gas taken in is about the same per minute in each engine.

The race, from the viewpoint of electrical equipment was a victory for battery ignition. Only the foreign cars, Peugeot, Bentley and Ballot were equipped with magneto ignition. Ignition trouble in these days of racing is practically nill. This was true today, with the exception that some plugs were changed.

The weather was ideal for racing and it is estimated that there were close to 150,000 people at the race which was the tenth annual event held on the famous Hoosier oval.



Line up of officials, drivers and mechanicians before the running of the Tenth Indianapolis

Bulletin *Board* Story *of the* Race

Mile by Mile the Romance of a Great Contest Unreels Itself Before the Eyes of Thousands Tense With the Expectancy of Daring and Disaster

SPEEDWAY, Indianapolis, May 30.—9:15 a. m.—A calm, clear morning as the care-free crowd gathers and the anxious drivers wait for the start of the Tenth International Sweepstakes 500-mile race. The sunshine diffuses softly over the paved oval. It's pleasant in the press stand, where all is a-bustle as the reporters prepare to bulletin the start to the afternoon papers, but it looks as if it would be pretty hot before the race is done. Barney Oldfield in his National pacemaker draws up in front of the judges' stand.

9:20—The band of 1,000 pieces parades in front of the grandstand. At the head is a detachment of marines. Alongside the band several men are carrying a powerful radio transmitting set, so that the fans throughout the country who listen in by the air route may hear. They say that the radio fans who didn't join the great throng which is rapidly filling the seating space here may actually hear the hum of the engines as the speeding cars make the laps and that all the announcements will go whirring to their ears. How the world does move!

9:35—The band comes down the straightaway again and stops in front of the grandstands. Both Fronty-Fords are to run, the announcer says. One went over the bank in its trials yesterday, but has been repaired.

9:40—The cars are coming out of the pits and lining up. Jimmy Murphy in his Murphy Special takes the pole position in the front row, which he has won in the trials. Ralph De Palma gets the first ovation as he drives his tan-colored Duesenberg to starting position. He lost an exhaust valve in a practice run last night and had to work fast to get his car back into condition.

9:45—De Palma and Harry Hartz are in the front row with Murphy. The first salute bomb sends a thrill of expectancy through the great crowd, said by the announcer to number 135,000. Twenty-seven cars are on the track, ready for the start.

Hot Off the Tape

THIS chronological story of the race, written in the press stand beginning shortly before the race started and continuing until the finish, is based on observations from the press stand and bulletins posted or announced during the race. As the flash bulletins were occasionally in error, the minor details of this story are subject to such corrections as may be indicated by the checked official records of the race.

9:50—Drivers and mechanics get to their cars. Four former winners are in the lineup—Goux, 1913; De Palma, 1915; Wilcox, 1919, and Milton, 1920. Curtner's Fronty-Ford, repaired after yesterday's accident, is running, but is not eligible for the prize money. The engines are started, and there is a great roar as the drivers tune them up.

9:58—Drivers and mechanics are in their seats, tense with readiness.

10—They are off! A balloon carrying the United States flag, floats over the field and provokes a cheer.

10:02—Murphy gets the first lap. They're strung out all the way down the stretch. The two Fords are last, one 30 feet behind the other. First lap, 1 min. 34 sec. Murphy gets the second lap. De Palma is third. Leon Duray second.

10:06—Murphy gets the third lap, with Duray scarcely 30 feet behind. The Fords are getting farther behind.

10:10—Murphy wins fourth lap. Duray second, De Palma third. Murphy has almost lapped the Ford. Murphy wins the fifth lap, having lapped the Fords. For the first four laps, 97.34 m.p.h. is Murphy's average speed. He wins the sixth lap.

10:15—Murphy wins seventh lap with a long lead. De Palma is back to fifth place. Wilcox slows up for a stop. Murphy still far ahead at the eighth lap, his Murphy Special running

International Motor Sweepstakes May 30, 1922, while a record breaking attendance waited expectantly

smoothly. De Palma goes up to fourth place. Duray is still second. Hartz is third. Average speed, 97.54 m.p.h. "Cannon Ball" Baker pulls into the pit.

10:20—On the twelfth lap Murphy is a stretch ahead. The Fronty-Fords are running consistently, hugging the inside of the track. Baker is back in the running. Position for thirteenth lap is: Murphy, Duray, Hartz, Mulford, De Palma. Average speed for first 20 miles, 95.74 m.p.h., as compared with 94.16 last year. Wilcox's Peugeot out with a broken valve spring.

10:30—Baker pulls into the pits again. The Fords are four laps behind. Thomas goes to the pits. Tommy Milton takes his Leach Special to the pits. Mulford stops with a flat tire. Cliff Durant goes to the pits. Mulford changes tire in 28 seconds and starts again.

10:35—At twenty laps the order is: Murphy, Duray, Hartz, De Palma.

10:40—Baker is in again, but his Frontenac is running like a truck. De Palma in fourth place is running well, but on twenty-third lap drops to fifth place. Murphy still leads, with Hartz second and Duray third. Sarles goes into the pits. Murphy has won 26 laps. Baker stops at the pits.

10:45—De Palma in fifth place at 27 laps sits calmly and easily at the wheel. He appears confident. Murphy still has a good lead and is running strong. At 30 laps the order is Murphy, Hartz, Duray, Haibe, De Palma. Jules Goux's Ballot Special out with a broken axle. Roscoe Sarles into the pits. Baker is running well again. Sarles lost 7 min. 17 sec. with spark plug trouble. At 85 miles the leaders have practically lapped De Palma, who is still in fifth place.

11—Jules Ellingboe spun around three times, hit wall, broke right rear wheel; no one hurt. Curtner's Fronty-Ford stops at the pits. Howard's is still running, six laps behind the leader. At 36 laps De Palma has moved up to third place, Murphy and Hartz leading him, in order. Duray is fourth and Haibe in his Duesenberg Straight Eight Special is fifth. The first five cars are separated by less than a lap. The race has not yet been won.

Jimmy Murphy was crowned the Big Chief of Mercury's hosts when Yellow Calf, a full blooded Arapahoe Indian at the race, bestowed on him his headdress. The above is Jimmy, not the Indian

11:05—Murphy finishes 100 miles, having won 40 laps. The order of the first five is unchanged. Murphy's average time is 94.07 m.p.h., compared with 93.74 last year. Duray slows up in front of stand. Fetterman in Deusenberg Straight Eight Special goes to third place, Haibe fourth and Eddie Hearne in Ballot Special is fifth at 44 laps. D'Alene's Monroe Special catches fire; extinguished and car continues. Cliff Durant goes to pit with frozen camshaft. D'Alene's car is pushed into pit. Murphy at 47 laps had lapped Hartz, who is in second place. De Palma is not among the first five. Sarles out 22 min. 54 sec. to adjust and drain carbureter.

11:20—At 50 laps the order is Murphy, Hartz, Fetterman, Haibe and Hearne. Duray moves up to third place, Fetterman dropping out of the first five. Fords at 125 miles are nine laps behind the leader. Curtner's car is back in race. Murphy is still a lap ahead of the next man, Harry Hartz.

11:30—At 55 laps Murphy and De Palma are running together, Murphy being two laps ahead. They keep the same position on the next lap. The fans cheer. On the next lap Murphy has gained 100 feet on De Palma, who still shows wonderful driving form.

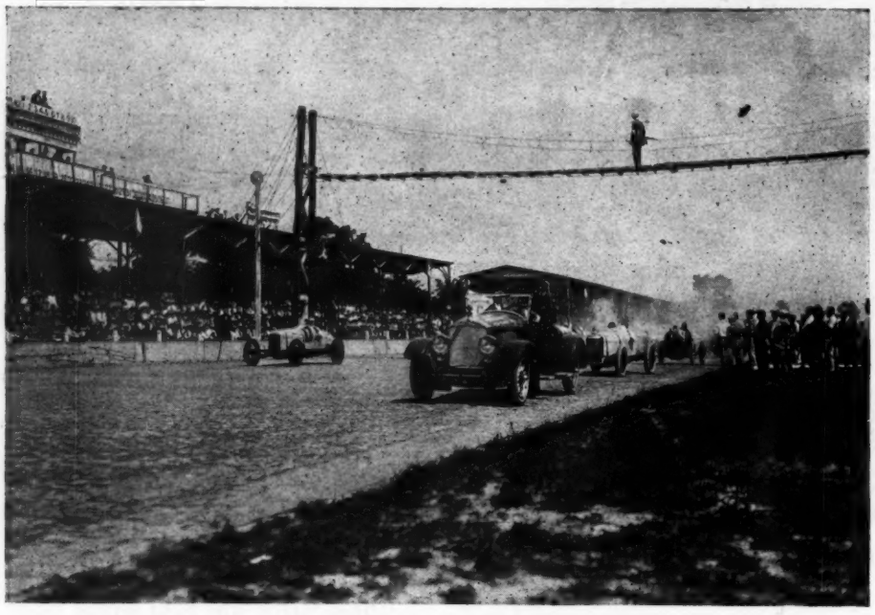
11:35—Some of the tailenders are showings bursts of speed. Hawkes in his Bentley stops at the pits. D'Alene back in race. Lost 17 min. 25 sec. Changed right rear wheel.

11:45—Hawkes is in again. Howard's Fronty-Ford stops for gasoline at 51 laps. Curtner's has done 41 laps, Murphy 63. Hawkes warned against driving in center of track at forty-first lap, and permitted to continue in race.

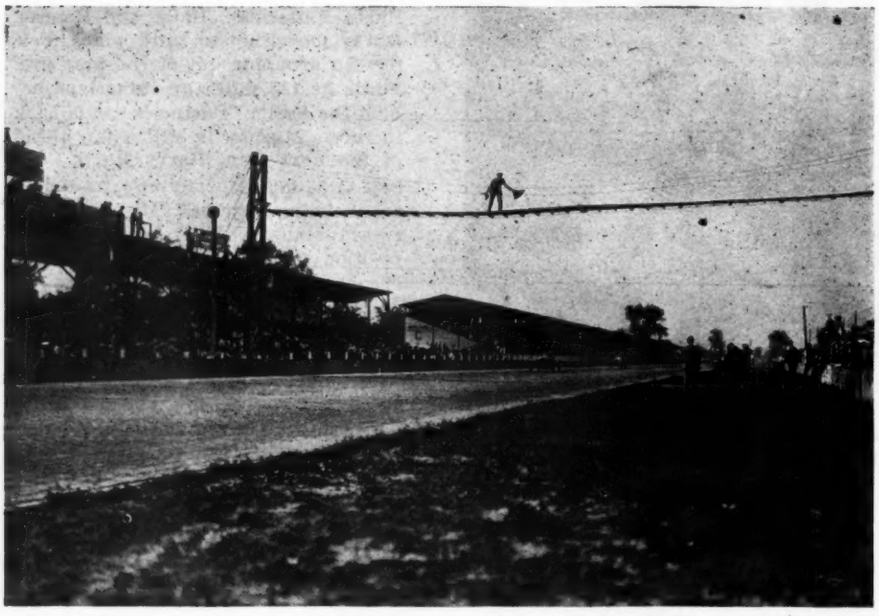
11:55—Joe Thomas' Duesenberg stops for water. At 72 laps the order is still Murphy, Hartz, Haibe, Hearne, Duray, the last named being a full lap behind Murphy.

12—Murphy at seventy-fourth lap stops at pit, his first stop. Someone else will take the lead. Hartz is the lucky driver on the seventy-fifth lap. Murphy is in again after tire trouble and taking gasoline. He has taken $3,250 in lap prizes. Joe Thomas' car broke steering knuckle in sixty-ninth lap and he is now repairing it. Murphy changed rear tires during his stop. The bulletin board order at the seventy-sixth lap is Hartz, Murphy, Duray, Haibe and Hearne. Hartz's lead is 26 seconds. Duray stops at pit

The Start and Finish of New Speedway Achievements



Barney Oldfield pacing the field for the first lap. It is at this time if never before that the spectator gets a real thrill from the sight and sound of thirty cars thundering on the heels of the pacemaker



The checkered flag to the winner. When this welcome sight greets the exhausted driver he knows his dream has come true and he will be honored, feted and placed in the records of racing fame

with broken axle on seventy-sixth lap. His car is Frontenac Special and was in third place. Howard's Ford in pit with broken steering knuckle.

12:08—Murphy in pit again on seventy-eighth lap. De Paola takes second place and Murphy goes to fourth. Hartz still leading. Mulford moves up to fifth place, displacing Hearne. The four leaders are less than a lap apart at 200 miles. Sarles to the pits. At 200 miles average speed is 93.52, compared with 93.66 last year. The order is Hartz, Da Paola, Haibe, Murphy, Hearne, Mulford, Fetterman, De Palma, Wonderlich, Klein. Time, 2:08:18.79.

12:17—De Paola takes the lead at eighty-fourth lap. Hartz is second, Haibe third, Murphy fourth and Mulford fifth. De Paola is driving the same car which won last year. Hartz on the eighty-fifth lap is half a car length behind De Paola. They're driving hard for the lead. Hartz takes the lead in eighty-sixth lap.

12:25—Hartz gains on the next lap. De Paola at eighty-eighth lap stops for gas and oil and tire change. Murphy is maintaining his position in third place. Haibe goes to second place and Fetterman goes into fifth. The order of the first five in the ninetieth lap: Hartz, Haibe, Murphy, Mulford, Fetterman. At 225 miles Hartz leads. Time, 2:23:45. Average speed 93.91 m.p.h., as compared with 93.66 last year. The four leaders are still in the same lap. A stop for gas would put any one of the leaders back of fifth place. Curtner's Ford makes 84 m.p.h. in sixty-seventh lap.

12:35—Murphy goes to second place, Hearne to third, Fetterman is fourth and Mulford drops to fifth. The four leaders still in the same lap. They are fighting for position and running fast, in ninety-seventh lap. They are nearing the half-way mark of 250 miles.

12:43—The race is half over, with Hartz still in the lead. De Palma stops at pit. Time, 2:39:11. Average speed, 94.23 m.p.h., as compared with 93.53 last year. The order is: Hartz, Murphy, Hearne, Fetterman, Mulford, Haibe, De Paola, De Palma, Wonderlich, Klein. Haibe, in fifth place, is two laps behind Hartz. Fetterman, in fourth place, is one lap behind. They are making good time. De Palma changed spark plugs in the one hundredth lap. Duray back in race after being out 44 minutes replacing rear axle shaft. Fetterman, in 106th lap, stops at pit. In 107th lap lead of Hartz over Murphy is one minute 25 sec. Wonderlich changed wheel and took gas in 2 min. 30 sec.

1:00—In the 110th lap Haibe, in fourth place, is two laps behind Hartz. Murphy and Hearne are fighting hard to overtake the leader. De Paola displaces Fetterman in fifth place. Both Fronty-Fords are running consistently, though dropping farther and farther behind the leader. Tommy Milton's Leach Special dropped out of race in its forty-fourth lap with gas tank trouble. De Paola in 111th lap hit wall and limped in with flat tire and wobbly right rear wheel. Is out of race.

1:10—Phil Shafer driving for Fetterman, whose car is in fourth place at 118 laps. Hartz stops at pit in 119th lap. Murphy now in the lead, having regained position he held throughout the early part of the race. The first five: Murphy, Hartz, Haibe, Hearne, Fetterman. Officially announced that Murphy has been leading the race throughout, despite apparent lead of Hartz, as bulletined, for a number of laps. Official check of time tape disclosed error.

1:20—Murphy leads in the 123rd lap and the next four in order are: Haibe, Hearne, Hartz and Fetterman. Duray to the pit again with broken axle. Time for 300 miles, 3:10:44.05. Average speed, 94.54 m.p.h.; last year 90.36. Order: Murphy, Hartz, Haibe, Hearne, Fetterman, Mulford, Alley, Wonderlich, Corum, De Palma. At 126th lap of leader, Haibe, in second place, is two laps behind Murphy. Murphy is making wonderful time, as the average speed as compared with last year shows. De Palma is driving masterfully and coolly but does not seem able to gain.

1:30—Haibe, holding second place at 130 laps, stops at pit for oil and water.

Time for 325 miles, 3:27:10. Average speed, 94.12 m.p.h.; last year, 90.33 m.p.h. Murphy leading by two laps. Hartz, two laps behind Murphy at 138 laps, has taken second place, Haibe dropping to fourth. Hearne is third and Fetterman is fifth. Murphy is driving at great speed and endeavoring to hold the lead which now appears fairly safe for him. The third car is three laps behind Murphy and the fifth is four laps behind.

1:45—Time for 350 miles, 3:42:51. Average speed, 94.23 m.p.h.; last year, 90.22. At 147th lap, being two laps in the lead, Murphy pulls into pit, changes tire and takes on gas in 38 seconds, retains first place. The order at 350 miles: Murphy, Hartz, Hearne, Haibe, Fetterman, Mulford, Alley, Wonderlich, Corum, De Palma. With 55 laps to go the leaders are pushing their cars, apparently to the limit. Heat waves are dancing on the long stretches of pavement, but the drivers are enduring well. Hartz creeps up and is only one lap behind Murphy. A fighting finish is in sight.

2:00—With Murphy at 150 laps the order is unchanged. Hartz, in second place, is driving hard and the slightest mishap to the leader would enable him to go to first place. Time for 375 miles, 3:59:02. Average speed, 94.12 m.p.h.; last year, 90.34 m.p.h. The cars are strung out all around the track. Haibe, in fourth place, stops at pit. De Palma is turning his car loose and passing a number of the near leaders, but Murphy is going even faster.

2:10—The race is getting noticeably faster. Murphy is not giving his desperate pursuers a chance to gain on him. In his 157th lap he advanced 300 yards in track position over De Palma. Mulford, Elliot and Alley stop at pits. De Palma stops. Hartz, still in second place, driving hard.. The two Fords are staying, the leading one having 125 laps to Murphy's 159.

2:15—De Palma is back in, having lost less than a lap on his stop. Time for 400 miles, 4:14:13. Average speed, 94.42 m.p.h.; last year 89.68. The drivers appear to be putting forth every ounce of energy as the end draws nearer. On his 165th lap Murphy advances his car more than 100 yards with relation to De Palma's position. Klein driving Leach Special in place of Frank Elliot. Baker's Frontenac Special goes to the pit with a broken gas line. Fire department drives in under subway, diverting attention of specators. Just a patch of dry grass. Baker returns to race.

2:30—Time for 425 miles, 4:29:44. Average speed 94.54 m.p.h.; last year 98.59. Five leaders in order: Murphy, Hartz, one lap behind; Hearne, two laps behind; Fetterman, three laps behind; Haibe, four laps behind. Thus the five leaders are spaced at intervals of one lap. Murphy is 14 laps ahead of Mulford, in tenth place. The speed has been getting faster. They can't do much better. Elliot again driving Leach Special.

2:45—Fetterman, in fourth place, stops. Murphy at 180th lap forced to stop for tire trouble. His lead over Hartz is only one lap. He will have to work fast. Only 20 laps to go. He makes the 181st lap 200 yards ahead of Hartz, having changed a tire in 50 seconds.

2:52—Murphy makes 182nd lap 500 yards ahead of Hartz. He is driving at terrific speed. Time for 450 miles (180 laps), 4:45:27.76. Average speed, 94.58 m.p.h; last year, 89.41.

3:00—De Palma has worked himself into fifth place, displacing Fetterman. He is eight laps behind Murphy and is in the same lap with Haibe, in fourth place. Only 11 laps to go. De Palma goes into fourth place, Haibe going to fifth. Murphy has eight laps to go and is speeding like the wind.

3:10—De Palma puting forth every effort to work nearer the front. Hartz is now two laps behind Murphy, who has but five laps to go. Hearne keeps third place.

3:15—Murphy has four laps to go. It is a tight rate between De Palma and Haibe for fourth place. De Palma is now about 50 yards ahead. Both are eight laps behind Murphy, who now seems sure to win, with only two laps to go and his nearest rival two laps behind. Elliot's Leach Special is showing a marvelous burst of speed, running neck and neck with Murphy for several laps, but being several laps behind.

3:17—Down the stretch for the finish. Murphy wins, but the Leach Special which has been pacing him stretches out ahead of him. Murphy's time is 5:17:30:79. Average speed for the 500 miles, 94.48 m.p.h.; last year, 89.62. Hartz is second, Hearne third and De Palma fourth. The tail-enders are coming in. Murphy wins about $28,000 for the day's work.

Howard's Fronty-Ford had 162 laps to its credit when Murphy finished the 200.

SAVIORS

By Homer McKee

ALL the brave men aren't in the army.

Out there on that track somewhere around a half hundred men, for six delirious hours, will look DEATH in the eyes, poke him in the ribs, slap him on the back.—KID with him.

——:——

DID you ever ride ninety miles an hour in an open race car no bigger than a bath tub, with the sun frying your brain, wind crushing you against the back of your seat, ears splitting with the crash of cylinders—the track and the world and your past pulling back under you like a torrent of milk, and all the while the blinding glimmer of the stretch ahead—always AHEAD—rising up to slam you in the face?

It's HELL, but a kind of happy hell that hairy men come back to year after year.

—Just like they re-enlist in the Marines.

——:——

WHY do they do it?

Confidentially, I'll tell you.

One of the boys out there, for example, has a new cotter pin he's experimenting with—he wants to know if it will HOLD. Here's how he tells. When the race is over, if he's ALIVE—it's a good cotter pin.

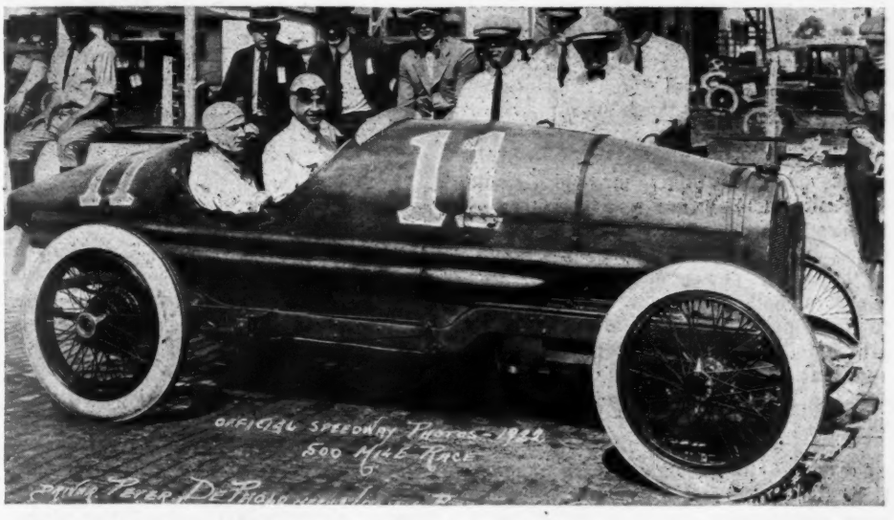
Another one has a new kind of steel in his steering knuckle that he's going to find out about the same way. "Dead"—no good. "Alive"—O. K. Get the idea?

What it takes to make automobiles SAFE, those men are out there to DISCOVER.

Every man who steps into anybody's automobile OWES HIS LIFE TO AUTOMOBILE RACING.

——:——

DON'T under-estimate these "race-nuts"—they are the GUINEA PIGS that take the deadly germ of ACCIDENT into their own blood and build up for us the ANTI-TOXINS that keep you and me and our families—ALIVE.



Diminutive Pete De Paola, protege of Ralph De Palma, gave a good account of his training

Racing Experience Helps Designers Obtain Greater Power and Reliability

Comparatively Few Engine Failures Noted—Compression Ratios Decidedly Increased—Effective Method of Spark Plug Cooling Evolved

By PAUL DUMAS

A PAIR of American designers captured the big end of the prize money at Indianapolis this year. The names of Duesenberg and Miller will always be associated with the running and winning of the Tenth Indianapolis Sweepstakes.

Looking over the results of the race one is impressed by the high average speed of the place winning cars. The engines this year were of the same displacement as last year but they were of considerably greater power than their predecessors of the same displacement.

Not only was there greater power but also greater freedom from the troubles encountered in racing engines of the past. The improvements that produced the increased power also produced increased reliability.

Higher Compression Ratios

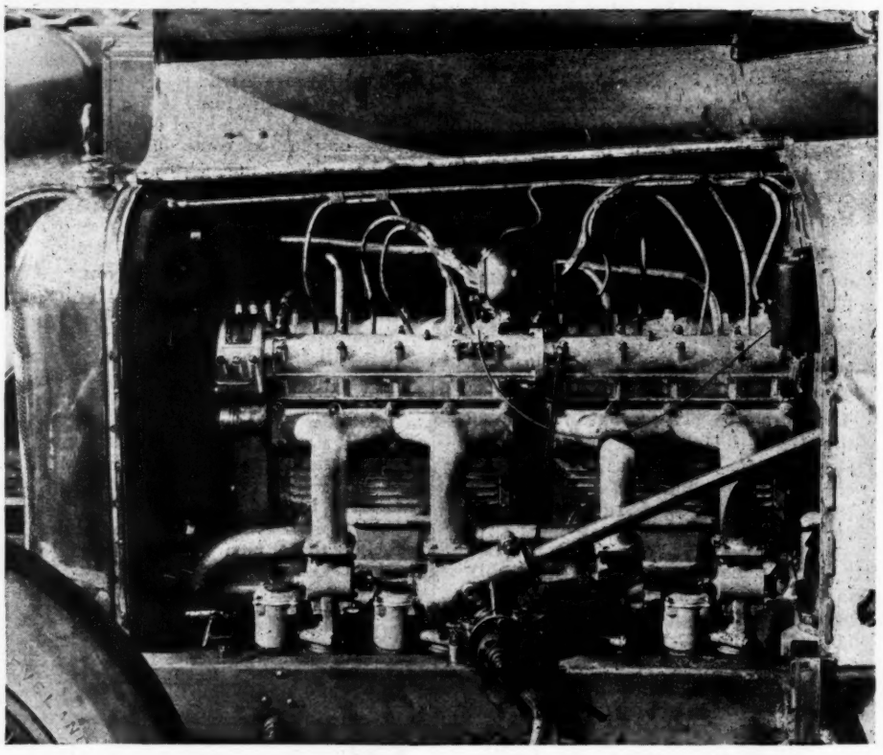
Greater power was secured by using higher compression ratios and improved carburetion and lubrication. High compression demands that engine cooling be adequate, especially the cooling of the spark plugs.

The development and refinement of design and construction has been concentrated, during the past winter, on the fast board tracks of the Pacific Coast. Los Angeles being the home of the parent Miller factory, it was only natural that Miller should take advantage of the opportunity for testing which was offered by the tracks in his home state.

In a somewhat lesser degree Fred Duesenberg has used the California boards as his testing laboratory. Louis Chevrolet did not fare well this year as his products were the victims of misfortune.

The great power secured from this year's models cannot be traced wholly to any one single item, although there are some outstanding factors which are apparent if a comparison of the early and the present day 183-inch engine is made.

Compression ratios have been increased from 90 to as high as 140 pounds. Both the Miller and Duesenberg engines have compression ratios in excess of 7 to 1. The first detrimental effects associated with these high compressions was the tendency to preignite. The chief item in bringing about preignition is overheated spark plugs.



The Miller engine used in Murphy's car. It is a straight eight using four carbureters. The valve action of this engine is extremely reliable. High compression ratio is a notable point in its design, being over 7 to 1. Preignition from overheated spark plugs was one of the "bugs" that had to be overcome as a result of this high compression. An ingenious method of spark plug cooling overcame the trouble

No Lubrication Troubles

Spark plugs that become overheated usually cause preignition and to secure the benefits of power increase through increased compression it became necessary to evolve better spark plug cooling methods. In this respect it is worthy of note to mention that the Miller engines have a very ingeniously yet simply arranged method of spark plug cooling which also holds true on the Duesenberg and Frontenac jobs, the latter two secure this effect through casting a continuous water jacket around the plugs while on the Miller, a removable threaded sleeve is utilized.

None of the winning cars were detained on account of lubrication trouble nor were any of the entries forced out due to that cause. The practical absence of oil on the track and smoking of the exhaust shows that this phase of engine building has reached a very high stage of development. No radical changes are noticeable in the lubrication system proper and the good performance is due to the generally high grade of balance and workmanship and the use of suitable oils. The majority of cars used a blended castor and mineral oil.

Valve actuating mechanisms as employed on the Duesenberg and Miller engines functioned without a flaw although the Frontenac engines seemed addicted

to this malady. The valve mechanism failures on these engines were attributed to faulty material rather than any defect in design. The Peugeot of Wilcox fell a victim to a broken valve which went through the piston head. The Duesenberg engines which have two intakes and one exhaust were the only three valve engines in the race.

Rear Axle Trouble

The aluminum alloy piston with very narrow rings was used practically exclusively. None of the place winning cars were troubled with stops arising from piston trouble.

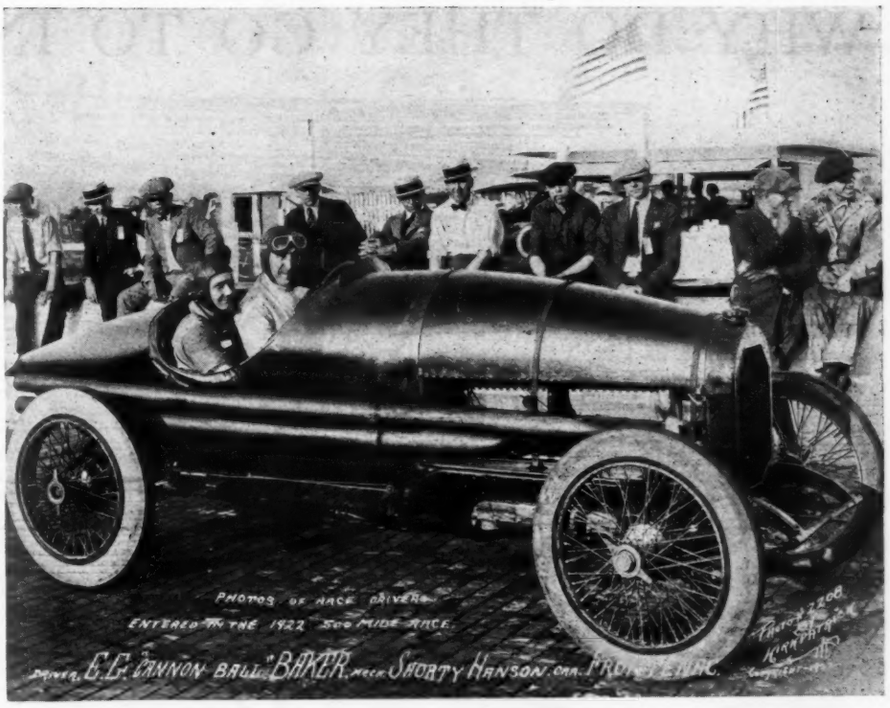
Going over the items that caused stops or withdrawals we find that rear axle trouble accounted for the elimination of at least two cars. Leon Duray who was well up among the leaders during the first hundred miles was forced to stop at his pit on account of a broken axle shaft. Some 44 minutes later he was again on the track but succumbed a short time later to the breakage of the replacement shaft. Peter De Paola, who impressed everyone by his skillful handling of the eight-cylinder Frontenac, skidded into the wall when the rear axle on his car locked. Contact with the wall practically ruining the rear spring assembly and the frame was badly twisted; nevertheless, Peter brought the wreckage into the pits under its own power. Jules Goux broke an axle shaft on the Ballot early in the race, leaving the French traditions to be upheld by his teammate, Eddie Hearne, on the other Ballot, who finished third without raising the hood once during the five hundred miles.

Exhaust Heat Bothers Mechanicians

Steering mechanism failures which are always considered as part of an Indianapolis track race were few. Thomas, Duesenberg, and one of the Fronty-Fords were the only two cars to suffer from that scare. Art Klein sustained a broken frame which put him out of the running.

The human element was ever present, as always. The extreme natural heat of the car itself and the fatigue-producing effects of the track and the distance covered caused many of the cars to draw up to the pits for relief mechanics or drivers. The mechanicians, especially, suffered from the heat from exhaust pipes, and required relief oftener than the drivers. The younger school of drivers suffered less fatigue than was expected. Jimmy Murphy, Harry Hartz, Peter De Paola, Tom Alley and Hawkes drove the distance without recourse to a relief driver. De Palma, Baker and Mulford were among the old school drivers who went the distance unrelieved.

Pit work generally was well executed. Murphy's team, which was headed by Pete Henderson, gave a splendid exhibition of well organized activity. De Palma, who besides being a driver, has a fondness for nice tools, had his array of copper plated wrenches and pliers arranged in a manner that his able pitmen always had the right tool at the right moment in the minimum time.



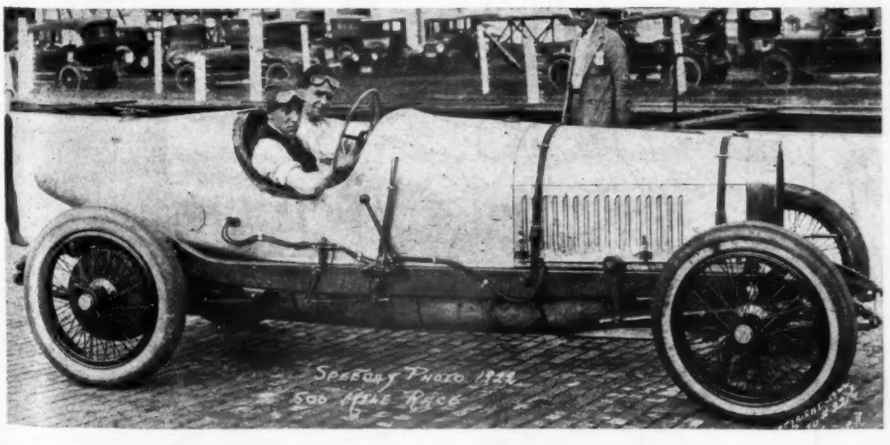
"Cannon Ball" Baker brought into play some of the stamina and perseverance for which he is noted. He is the hero of hundreds of cross-country record smashing experiences and well known to the public. His car performed badly at the start but he was not daunted

Speedy Tire Changes

On the cars that were equipped with disk wheels a very fast demountable hub was used. The speed made on tire changes was due to well directed human effort and the use of speed demounting fittings. The racing hubs used on the disk wheels are an excellent example of a rugged and rapid locking and unlocking device.

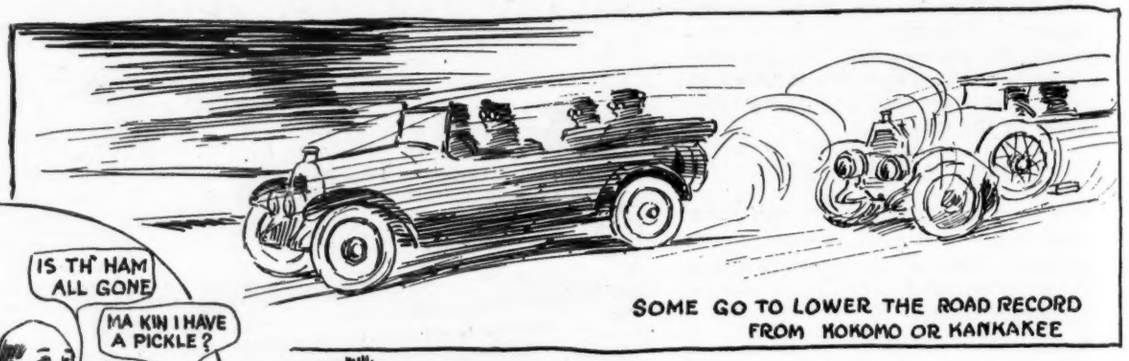
Tom Milton's car which made a poor showing due to a broken gas tank fastening showed well in the qualifying trials and much was expected of it. The car was capable of turning laps in 1:28 but was handicapped in this race. Due to lack of preparation and unsuitable balance its excessive speed could not be used. An interesting feature of this car is the transverse system similar to Ford. To secure a low resistance chassis Milton eliminated all wheel brakes, placing both emergency and service brake on the driveshaft.

Cliff Durant Special carried four wheel brakes of the mechanical type. This and Jerry Wonderlich's hydraulically controlled brake and Frank Elliott's Miller were the only cars equipped with brakes on the front wheels. Four wheel brakes, no doubt were a factor in securing maximum engine revolutions on the main stretch and braking on the turns without any great reduction in engine speed. All brakes were on the internal expanding type.

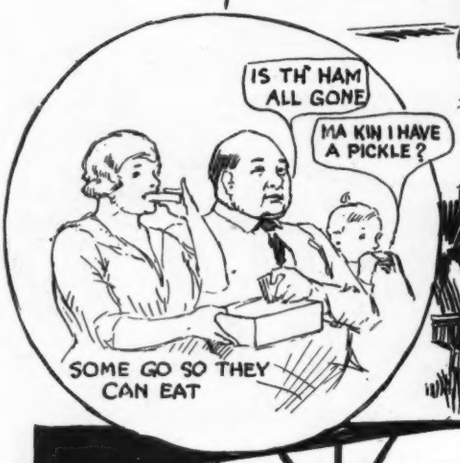


The Bentley Special which ran the entire race without a stop. This is essentially a stock chassis and has turned up 95 m. p. h. in England

WHY DO THEY GO TO INDIANAPOLIS?



SOME GO TO LOWER THE ROAD RECORD FROM KOKOMO OR KANKAKEE



WE DONT KNOW WHY THIS BIRD GOES

ABOUT 50000 TRY TO SEE THE RACE THIS WAY BETWEEN HATS AND HEADS AND POSTS AND THROUGH WIRE FENCE

THE SWEET BUT MORBID PERSON WHO DOES HOPE NOONE WILL GET KILLED BUT IS ALL EYES FOR AN ACCIDENT

WILL THEY ALL COME BACK NEXT YEAR?

The Place of Advertising in the Selling of a Car

Commonsense Demands Co-ordination Between Two Efforts But That Seldom Exists

By NORVAL A. HAWKINS

Director of Sales, Advertising and Service, Advisory Staff, General Motors Corporation.

IN A recent issue of MOTOR AGE was printed Hawkins' speech before the Michigan Automotive Trade Association. Because of the length of the document, the section regarding advertising was omitted for later publication. The following is a record of the comment on this "Second Essential of Selling":

Advertising is a second major essential to our job of bringing business back. Advertising is only a form of selling. It is the advance card of the personal salesman, in most businesses. Sales and advertising are essentially inter-related, but it is astonishing how little real salesmanship there is in the average advertisement, and what a poor advertiser the average salesman is.

Co-ordination of Selling Effort

It is simply common sense that sales work and advertising should be perfectly co-ordinated, but they seldom are. Good advertising, properly co-ordinated with selling, is one of the most important agencies of economical distribution. But average advertising is either grossly or partially wasteful because it is not intelligently tied up with a sales objective. Far too many advertisements only mirror personal vanities and idiosyncracies of advertising theorists, who are not salesmen at all in the truest sense.

I take off my hat to the advertising man who thinks as a salesman. I always feel like taking my coat off to show my opinion of the so-called advertising man who thinks only as a spender of an advertising appropriation. I might say in this connection that I think the most inappropriate thing for an advertising department to have is an advertising appropriation. I don't believe in signing blank checks. In my opinion, an advertising manager or agent should be required to give a plan and a specification, and make an architectural drawing of a plan and its results, before getting money for publicity.

I would hesitate to say how much money is being wasted in advertising at the present time. I know that every advertising man will agree with me that it is tremendous, because I never knew an advertising man who could not show me things that were wrong with the "copy" of other advertising men.

Efficient Production Carries the Load

Every dollar unnecessarily added to costs, every dollar that does not represent full value to the ultimate user or buyer of the product is a detriment to the success of a business. The wastes of inefficient advertising, like the wastes of inefficient personal selling, have piled up enormous burdens that must be carried by efficient production.

The chief fault of nearly all distributing methods of the automotive industry has been exaggerated emphasis of quality in product. There was a time, of course, when improvements constituted real selling factors. But now, after the product has been largely standardized in the respective price classes, advertisers and salesmen still continue to claim points of superiority in particular cars. The prospect knows all the various vehicles cannot really be the best, so much claimed points of superiority have little effect, and making them in advertisements or by word of mouth is a waste of time and money in most instances.

The reason for poor salesmanship and advertising lies in superficial thinking about distribution. Automobile manufacturers have had keen vision in engineering—some of them have seen pretty clearly in actual production—but not many of the existing companies show real far-sight in distribution.

All companies make their selling hard work because they don't start from the fundamental comprehension of what should be sold. They have been striving against each other to sell goods; whereas they should have worked primarily to sell the ideas of motor travel, transport and traction.

A Suggested Idea and a Stated Fact

A suggested new idea is more likely to be effective with a prospect than is a stated fact that is unfamiliar to him. The mind meets the statement of a fact with questioning or opposition. Hence the statement in advertising or in a selling talk, of claimed points of superiority in product does not create the desired impression on the prospect that the product is really desirable.

But if an old, familiar idea is brought to the present consciousness of a prospect in such a way that he accepts it as one of his own facts, a suggested inference from that fact will also be accepted as a fact, though that inference is entirely new to the prospect.

To illustrate with regard to effective advertising of a passenger car: The prospect is not convinced by a claim that a certain car is the most beautiful car in America, that another car is the comfort car, that still another is the thrift car. He doubts the truth of such a claim.

The salesman of a fourth manufacturer could convince the prospect that the fourth car was more beautiful than the first, more comfortable than the second, and a more thrifty purchase than the third. Such advertising, at most, sells only familiarity with a name. It does not really attach to the product the claimed attributes of superlative quality.

The Desire for Transportation

What the prospect wants is to travel, on business or pleasure, by motor car. He wants to travel in a handsome vehicle, comfortably, and economically—all as a matter of course. His need would not be satisfied in any degree if he were to sit in a motionless car, however beautiful, and however comfortable his seat. It would not suit his desire, to be thrifty by standing still. All his other wants are subordinate to dependable transportation by motor vehicle.

The effective advertisements, therefore, will be of motor travel and transportation as desirable. The prospect will accept statements about that as familiar facts, without question. He also will not resist statements to the purport that he wants to ride handsomely, in comfort, and thriftily.

Then, if the advertisement contains the picture of a car evidently handsome, and that looks comfortable, and which is priced on an economical basis, the prospect will get by suggestion and will accept as facts, precisely the ideas the distributor wants him to have, but which could not be pounded into his head by any claims of superiority in appearance, comfort, or economy.

Motor Travel to the Fore

In short, the advertisement should state nothing about the product but indisputable facts—such as price, wheelbase, equipment, etc. There should be no extravagant statements of quality of product. And the product should be mentioned only as incidental to motor travel and transport.

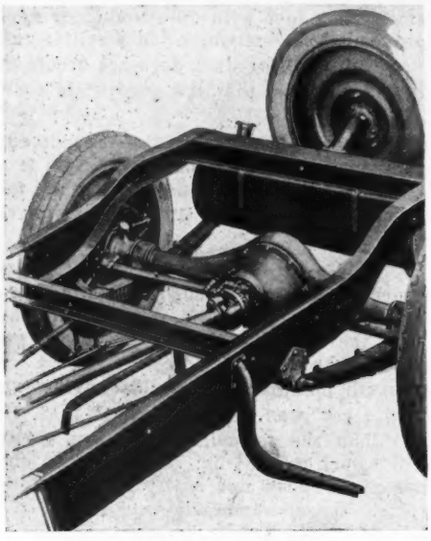
This idea of motor travel and transport never has been sold with the product completely subordinated. Always the product has been pushed to the front, with some claim of peculiar excellence. In my opinion the advertising of the future will be dominated by the organization which first establishes and which maintains the unique standard of ideas of motor travel and transport to the fore, and product facts of quality implied but seldom stated, far to the rear.

New Body Offerings of Four Manufacturers

Davis Model 71 Phaeton

THE model 71 Davis 5-passenger phaeton announced at the time of the Chicago show is now in production and going to dealers. The car sells for $1195 and in it are incorporated such units as the Continental 6Y engine, Borg & Beck clutch, Timken axles, Delco electric system, etc. The weight is 2645 lbs. and the car has a wheelbase of 114 in. Five Disteel wheels are furnished as regular equipment and these are fitted with 31 by 4 in. cord tires.

New Davis model 71 five-passenger phaeton selling for $1195



The rear cross member of the Davis frame practically covers the gasoline tank

The 6 Y Continental engine already has been described in these columns. Briefly, it has a bore and stroke of 3⅛ by 4¼ in. and is said to develop 50 hp. at 2600 r.p.m. The crankshaft is four-bearing and hollow for the full pressure system of oiling. Other features include a detachable cylinder head, chain-driven camshaft and generator, with a unique and readily accessible adjusting feature. Cooling is by pump through a cellular radiator.

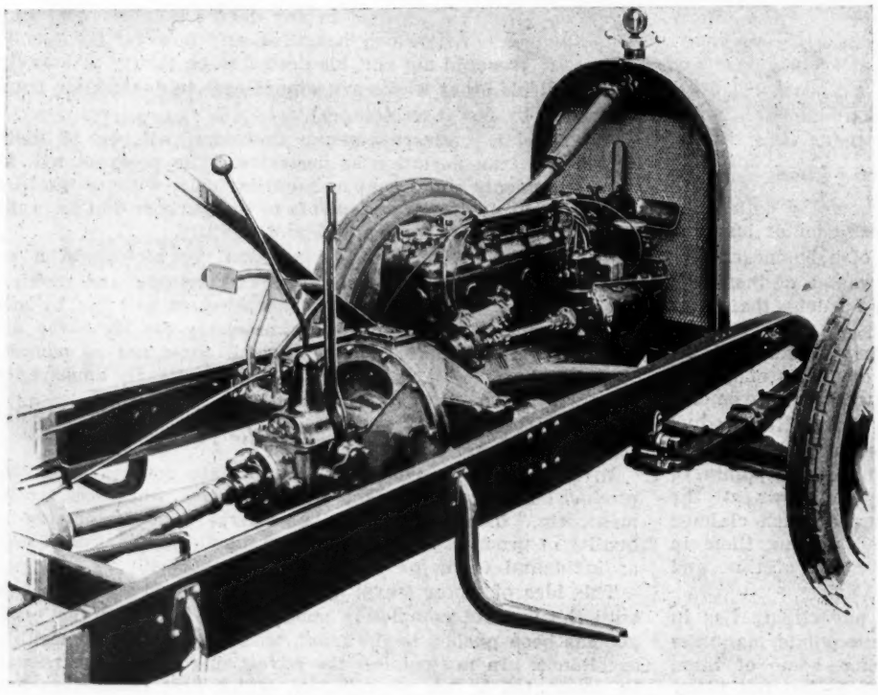
The drive from the engine to axle is taken through a Borg & Beck clutch, Warner gearset and Peters universal joints and propeller shaft. The frame, of 6-in. channel and with a rear cross member 10 in. wide is carried on front and rear springs measuring respectively, 35 by 2 in. and 52 by 2 in.

The body finish is dark blue for body, hood and wheels, while the fenders and chassis are in black enamel. Drum-shaped headlights, finished in nickel and black enamel add a distinctive touch.

The curtains are hand-tailored to each individual body. They are designed to give extra light to the interior and splendid vision to the driver. They open with the doors, of course.

The top is made from double-texture Ever-dry fabric and is hand-tailored to each individual body. A large rectangular plate glass rear window is provided.

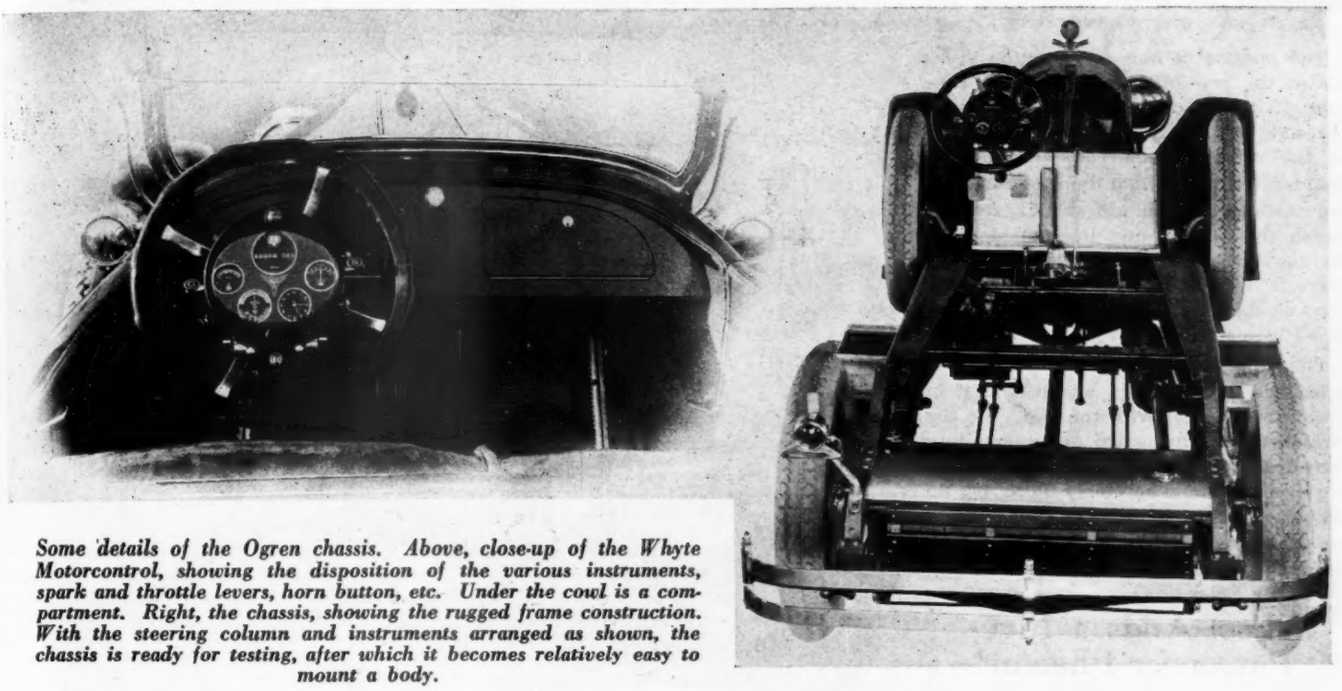
The upholstery is genuine leather, French-pleated over curled hair pads and oil-tempered springs.



Accessibility has been well worked out in the model 17 Davis. The frame is 6 in. deep

Ogren Six in Four Body Styles

ONE of the recent additions to the high-priced field of cars is the Ogren Six, built by the Ogren Motor Car Co., Milwaukee. While one chassis is available there are four body styles, including a roadster and touring at $4250, coupe and sedan at $5200 and $5500 respectively and a special touring at $4375. The major specifications of the car include a wheelbase of 134 in., six cylinder Continental engine 3⅝ by 5½ in. developing 70 hp. and 33 by 5 in. tires. The latter can be had in any make desired.

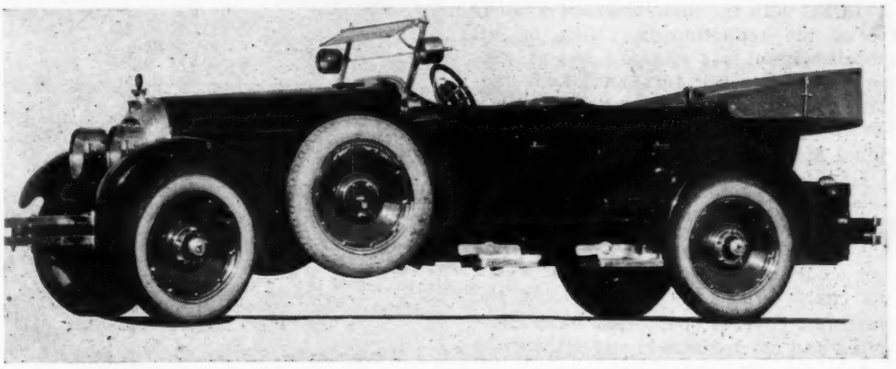


Some details of the Ogren chassis. Above, close-up of the Whyte Motorcontrol, showing the disposition of the various instruments, spark and throttle levers, horn button, etc. Under the cowl is a compartment. Right, the chassis, showing the rugged frame construction. With the steering column and instruments arranged as shown, the chassis is ready for testing, after which it becomes relatively easy to mount a body.

The frame of this chassis is exceptionally sturdy, the side rails being 7¼ in. deep, with flanges running from 2 to 3¾ in. It is carried on semi-elliptic springs, the front measuring 38 by 2¼ in. and the rear, 59 ½ by 2½ in. Wood, Disteel or Rudge-Whitworth wire wheels are optional with purchaser.

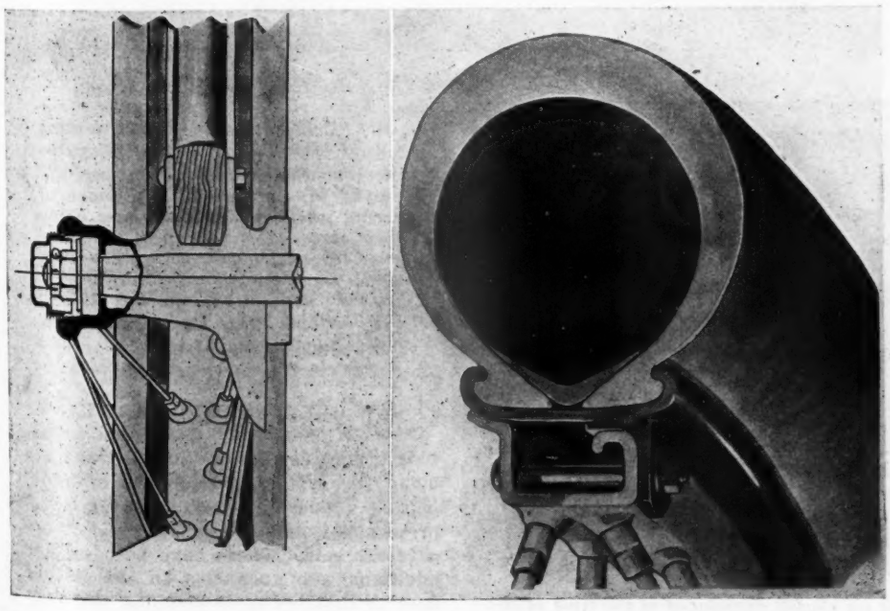
The engine accessories include a Bosch magneto and Rayfield carbureter. Oil is fed by a gear pump direct to all bearings. The clutch and gearset are in unit with the engine and of Brown-Lipe make. The electric system, a two unit type is of Bosch make.

The equipment of the car illustrated includes the Whyte Motorcontrol in which all the instruments usually mounted on the instrument board are incorporated in a metal case in the center of the steering wheel. They are readily accessible by the removal of the cover, which necessitates the taking out of two screws. At the lower end of the steering column is located the fuse block and at this point all the connections including speedometer, choke, engine temperature gage, body wiring, etc., are made.



The Ogren Six, said to be one of the most completely equipped high priced cars on the market. Its wheelbase length is 134 in.

The bodies are featured by high class coach work, with colors optional. There is also a choice as to color of top material, that is, black or khaki. Upholstery is carried out in very heavy leather in a color to match the body. Equipment includes Kozy wings, bumpers front and rear, spotlight, tire covers and extra tires and wheels. In fact, there is little left for the purchaser to buy in the way of equipment.



Sectional view of hub of new Hayes wheel and section of rim

Hayes Wire Wheels Have Demountable Rims

THE wire wheels now being made by the Hayes Wheel Co., Jackson, Mich., incorporate two features of interest, namely, the interchangeability with wood wheel hubs and demountable rim. A set of Hayes wire wheels consists of four wheels and a spare rim in place of five wheels and a special wheel carrier, thus

saving the cost of the extra wheel and carrier.

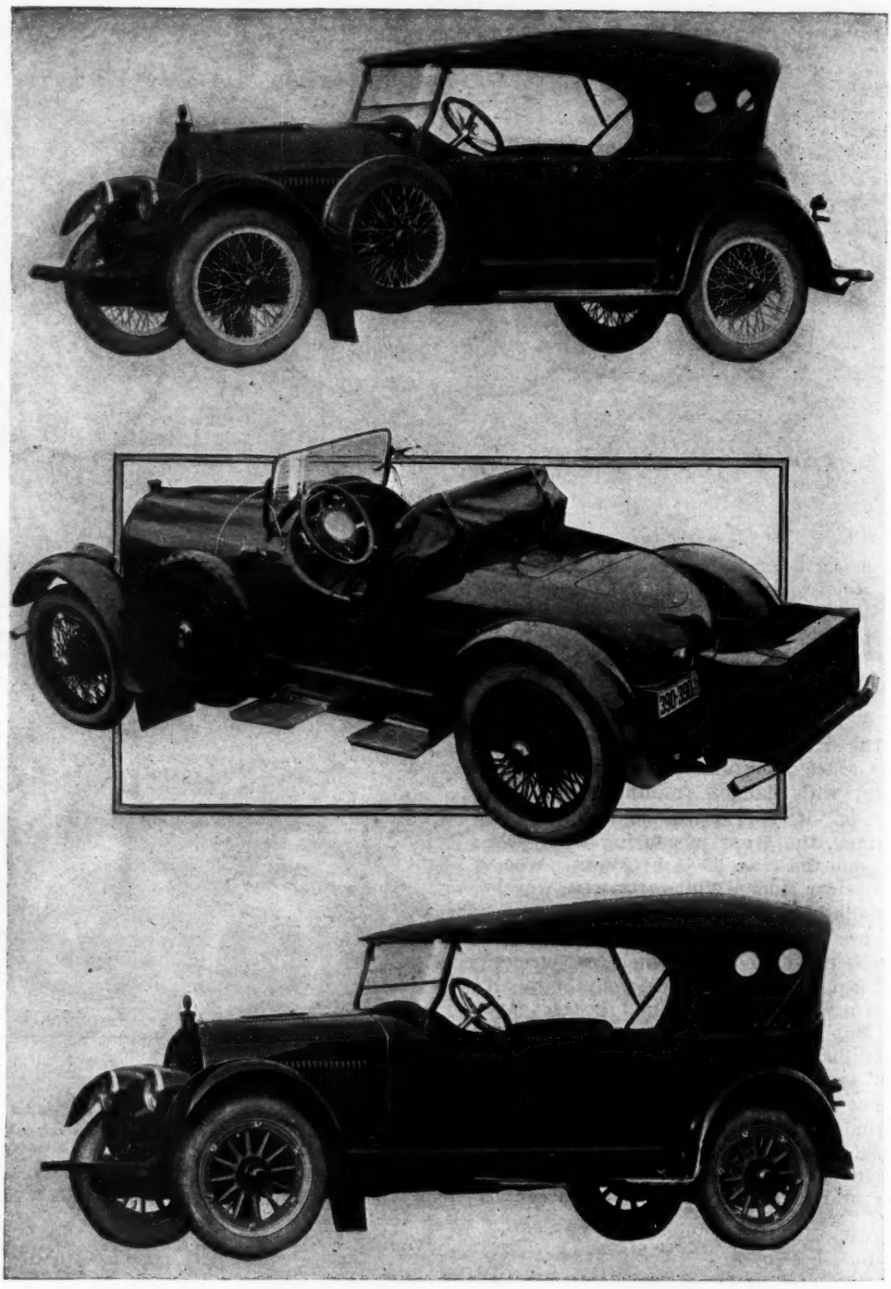
The method of hub construction eliminates the possibility of the wheel running off the axle as it is locked on with the axle nut and cotter pin the same as the wood wheel. The wheel has a channel felloe to which the spoke nipples are fastened, which allows a space between the nipples and the outside rim, giving a smooth seat for the tire, so there is no wear at this point. The hub slips on the axle without additional parts or adjustment.

The rim demounts very much like a wood rim and the lugs which hold it in place are integral with the rim. All the strains are compensated and taken into consideration so that all driving studs are eliminated. Therefore, there are no driving studs to shear, and all strains are compensated so that there is no slipping of the rim upon the felloe band.

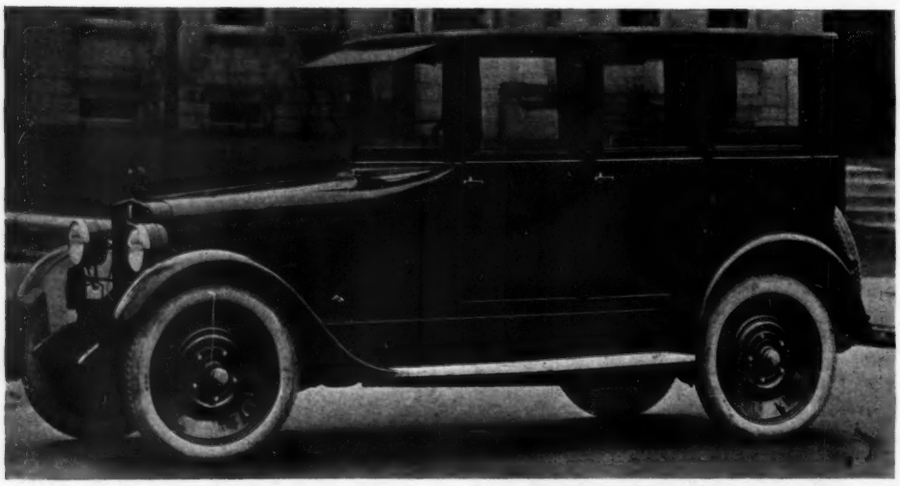
Kissel Adds a Five-Passenger Phaeton

ALONG with its announcement recently of the reduction in prices on all models, Kissel has added a five-passenger phaeton to sell for $1,885 f.o.b. factory. The newcomer is equipped with a Kissel designed and built body, individual steps and fenders, and the whole is mounted on the stock chassis. Wood wheels are regular equipment and these are fitted with cord tires, with a spare rim at the rear. The coachwork on the new model is in keeping with that which has characterized the other models, the aluminum covered body being hand hammered and molded directly over the wood framework. The crown fenders are hand rolled in pairs and the hood is hand fitted to each car.

The De Luxe models, in addition to individual steps and sport fenders, have a trunk rack, six wire wheels, two bumpers, four snubbers and four cord tires as regular equipment.



Top, De Luxe model of Kissel, on which the wire wheels are regular equipment. Center, special Kissel touring roadster, fitted with Whyte Motorcontrol, in which all instruments are grouped in one case in the center of steering wheel. This car is now being driven across the continent by Congressman Clifford Ireland, carrying a message from President Harding to the Shriners' convention on the Pacific Coast. Below, the new phaeton, recently added to the Kissel line. Wood wheels are regular equipment



Columbia has added a sedan body for the light six chassis announced at the time of the shows this year. It is a four-door type and is priced at $1395

NEW ORLEANS USED CAR PLAN

New Orleans, May 29.—Exactly one-half of the dealers in New Orleans are using the system of exchange of information concerning used cars on hand, prices paid and prices at which these cars are sold. There have been neither additions nor vacancies in the list of dealers that began exchanging this data in December.

Are You a *Dealer* or a *Broker?*

WHAT Is Written Here Is an Informal Interview with a Man Who Has Been Successful as a Factory Service Manager, as an Executive in a Factory Sales Department and Later as a Merchant

By CLYDE JENNINGS

Are you an automobile merchant or merely a broker?

Do you know the test whereby you can check yourself on this point?

The above questions really are pertinent. It is more than important that every dealer know their answers. They mean very much to his future. After the man selling cars answers them, he will know when to get out of the business.

If he is a broker, he wants to get out as soon as possible after he has reaped the harvest of first sales. At least he must change towns or line of cars, because only the merchant will be able to take care of the merchandise he has sold and enjoy the returns of repeat sales and reputation.

Every business man knows that when bad times come it is the broker who suffers first and most. The merchant has a reputation that he must care for and which will help to support him in time of need, if he is a good merchant.

One test you can make for yourself as to the proper classification of yourself is this:

Do you spend most of your time and interest with prospects or customers?

Character building is the most important item in the career of a business establishment. The dealer who places profit on the immediate sale above the good will of the man after the sale is made, has missed his calling—if he is in the automotive business. Reputation is the keynote of automobile selling, because a car once sold should be a source of profit while it is in the buyer's hands. And it also should serve as an advertisement for your business.

The Chief Topic of Interest

There is no topic so frequent today in social and friendly conversation as the automotive vehicle. Wherever friends or strangers meet they find a common topic in their opinions of motor cars. The value of a pleased owner, who goes among his friends spreading your propaganda, is of very definite value. If you take care of the customers, the prospect will, in the main, take care of themselves. If you neglect the customers, you will always be doing business with strangers.

Another test by which you can classify yourself:

Is your maintenance department a place where you "stop the kicks" or is it a place where your customers are cared for?

Is your maintenance department conducted at a profit, or is it an expense, where you make good on foolish promises of yourself and salesmen?

It is a fact that only a small proportion of the men selling motor cars today have established business reputations that are sufficient to protect them against financial stringencies and competitive inducements of a questionable character. The industry has just been through a period of that kind and if you will think over the list of those who survive, you will find them divided into two classes:

Those who had built a reputation on proper selling and proper maintenance; and those who were helped over the bad period by the factory.

Those who survived by the second clause are not independent dealers. They cannot, by the very nature of things, class themselves as merchants. They are agents. They cannot, because of their obligations, be free to change their line if the factory product proves to be unsatisfactory, nor can they profit as much as they should by their own efforts. Manufacturers are not in business as charitable organizations, and when they lend assistance they demand pay for this service.

Still another test as to your position:

Are you selling motor cars today because of the reputation of the car or because of your reputation in the community?

There is not an automobile manufacturer of standing today who does not recognize the importance of the dealer in his business.

Advertising does not and will not sell cars—with rare exceptions. It is not the province of advertising to take orders—if it was there would be no dealers. Manufacturers in all lines would merely advertise their goods and let the people order them. Distribution would be a matter of the organization of transportation rather than the organization of men, buildings and credit.

The Mail Order House

Advertising helps sales—that is what it is for. It lessens the cost of a sale to approach a man who has been interested in the advertising for the car you represent. But he wants to feel the car, see it and to know that there is some one he knows in his community who is interested in this car, some one who knows more about it than he does.

There have been a good many efforts made to sell cars by advertising. Quite a number of firms have gathered considerable money to embark in this enterprise, but none have succeeded. Even the established mail order houses are not today offering the complete motor vehicle in their catalogues. It is about the only articles of common consumption that they do not offer.

Any established mail order house will tell you that their business thrives on the incompetence of the local merchants. One of the most notable evidences of incompetence in merchandising is the inability of a merchant to realize that he must make only a fair profit—that if he cannot do business on a fair profit that something is wrong with his business.

Only recently a merchant in an Illinois city—a man of wide and profitable experience in several lines—said:

"I would today be driving a Blank car, except that John Doe sold it here. I know that the Blank is one of the best cars for the money made and I like it. But I cannot believe in Doe. He won't let me. He sticks me on nearly every deal I have with him. He does not try to keep good mechanics. He is a trader and I cannot believe that any factory will tolerate him for years on end as a dealer. I know very little about the inside of the workings of the car and I must buy of

some one who will always tell me the truth, or whom I believe will tell me the truth.

"I had trouble with my car the other day and took it to the service station. They were stuck for the time being. I left the car. An hour later they called me to come and get it. They had found a broken wire in some hidden part and they charged me a few cents for the time employed. I believe that if I had been the owner of a Blank car and had taken it to Doe, that he would have charged me a good round sum for a general overhaul of the electrical system."

If you are in doubt as to your classification—as a broker or a merchant—find how you stand in your community.

Still another test of your position:

Does your maintenance department compare with your salesroom?

There is a distributor in a western city—or there was—whose salesroom was a wonder. He had devoted much time and thought to the colors for the walls, the system of flood lights, the box plants and he paid an interior decorator a nice sum to select the furniture that was placed in the cozy corners and in the closing room. Each salesman had a mahogany desk with his name on top. He had done quite well in selling too. The car he sold enjoys a very good reputation and he capitalized this to a good advantage.

But after he had been in business two years his maintenance department was a sight to behold! The equipment comprised some hand tools, two vises and an arbor press. One of the vises was broken! None of the mechanics had been employed longer than three months. And this man wondered why his business did not show the upcurve that was being reported in other centers and which some of his own dealers enjoyed—for some of his dealers had put themselves on a good basis without leadership. There are such men.

The distributor was suffering from business astigmatism. He probably received his training back in the days when lightning rod salesmen made fortunes and when stoves and similar heavy merchandise were sold by wagon peddlars who never traveled the same route twice.

The present standing of the motor car industry is a tribute to those manufacturers who have been honest and who have striven to produce the best merchandise possible. Their product has been—and is today—easy to sell. In the main the manufacturer has been wise enough to carry enough margin in the factory price to care for the difficulties that have arisen from incompetent merchandising. As a rule, the matter of price has not figured much. It has been only relative among cars.

Now there is a different situation. The public is buying more carefully and as this public becomes more familiar with motor cars and as the design becomes more standardized, the public is asking questions as to price and value. Each manufacturer is today anxious to get down to a rock bottom price. He has cleaned house at the factory. Production costs have been gone over with a microscope and there probably is little more to be accomplished there.

Selling Cost Too High

Every manufacturer knows that it is costing him too much to sell his products. He also knows why. He knows that the public has paid for a long series of experiments and that it is about time to stop experimenting and get going on the straight course.

More factories are studying merchandising today than ever before. Most factories are looking over the dealers one by one. No sub-dealer is too small to come in for a few glances. Not only are dealers examined as to how many cars they sell, but what the community opinion is of the car.

Sometime the factory will strike, and strike hard. The dealer who has not answered some questions for himself will wonder why he has been jerked out of the game and put on the side lines.

Familiarity often breeds contempt, but again it breeds self contentment. At the same time familiarity is the best possible basis for a close inspection. The dealer who is so smug as to believe that he is a "boy wonder," is quite likely to be a failure.

It is a pretty safe basis never to believe that you are a success on your job until some one who doesn't like you tells you so. Then don't let it go to your head, but look around and see where the weak points are so that you can take a few more steps forward.

The automotive selling business is about 20 years old. It is about time that it began to be self-supporting. A good many factory men think so and they are about in the attitude of the father who has sent his son to school, supplied him with money for some pleasure trips and suddenly is confronted with the question of marriage. Then the father rips loose a few profane remarks on self support, charity and a few other things.

Checking Up On Dealers

The manufacturers have paid the bill for education, they also have paid for a good many pleasure trips and they have even supported the dealers who were so foolish as to get into entangling alliances with free service and that questionable character—the used car. All of this has served one great purpose: It has caused the manufacturer to wonder how long he was going to be to continue to supply these wants and to eventually look over his long list of children and

learn that some of progeny was worth while, self-supporting and had no questionable companions.

Now he is about in the humor of forcing the wild ones to come up to the standard of the good boys. When he does, he will quickly separate the brokers from the merchants.

What does the manufacturer require?

Only two qualities besides ordinary business intelligence. They are

1—Honesty.

2—Interest in the customer.

It would seem that the first requires no comment, but a long association with merchants would lead to be the belief that some men do not understand honesty. We frequently hear the word used as a synonym for paying of bills or borrowed money; telling the truth technically and a few apparent qualities.

But there is more to honesty than that. There is a fundamental honesty that implies sincerity. It requires the man who accepts a dealership must first sell himself on the car. It causes this man to study the sales contract to the last letter, so that he can assure himself that he is willing to carry it out. It also causes the man to keep in close touch with his sales organization, so that he may know that cars are being properly sold.

Fireworks and Flag Waving

The second requirement—interest in the customer—has many ramifications and it must be suited to all kinds of human nature. It is the maintenance department. It is all that service in a mercantile establishment can be.

There are many dealers who will cross the street to evade meeting owners. These dealers know full well the owner is not satisfied and probably from some fault of his or his organization.

This is the sort of a dealer who builds a fine salesroom, but forgets about the maintenance department. He has smiles, cigars and handshakes for the prospect, but two days after the prospect becomes a customer he merely nods to him, listens nervously for a moment and says "Mr. So and So will take care of you," or he advises "Tell your troubles to the mechanic."

Then he turns to another prospect to talk speed, upholstering or what ever point the prospect may have uppermost in his mind.

The prospect buys a car for transportation and the dealer obligates himself and the organization to supply that. Then the dealer fails to stock replacement parts. The best of cars occasionally fail, and a car is of no use to the customer until a replacement part is at hand. The dealer who has made no provision for this occasion is not properly interested in his customer and—more than that—he was dishonest when he sold the car without intending to stock these parts.

The great public is tolerant and charitable. The average man is inclined to be tolerant "when up against it." This attitude of the public has caused many dealers to become careless and has even caused a great many of the employes to assume the attitude that a customer who demands sincere interest and honest service is a "crab" and a "kicker."

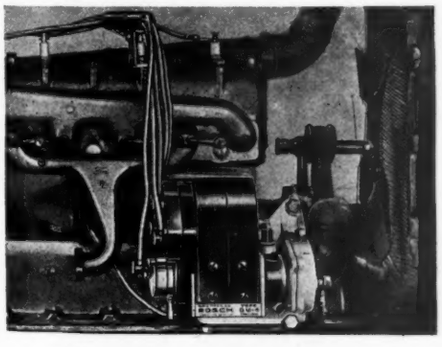
Some Housecleaning Needed

There are many things wrong with the motor car industry—from the ignorance of the owner up to the carelessness of the producer of raw materials. Within the last few years the manufacturer has been getting control of his end of the business and while he is not yet perfect, he has made such strides that we cannot fail to congratulate him on his present position.

The greatest fault today is the point of contact of the car owner with the producer. Any manufacturer will tell you that he has neglected this in the past—and still is neglecting it in some regards but he hopes to improve the situation in the very near future.

Perhaps some dealers have not stopped to think just how good a job the manufacturers are making of their own house cleaning. It is entirely possible that a good many dealers have never stopped to think just what proportion of the automotive costs are charged to selling. If the dealers will give these questions some consideration, there is no doubt that they will be ready to remodel some of their activities to bring their end of the business up to the standard of the manufacturing.

If the dealers will take hold of this problem, there is no questions that they can bring their end of the business up to the proper standard, and then, no doubt some of the recalcitrant manufacturers will seriously take up the question of supplying replacement parts at fair prices.



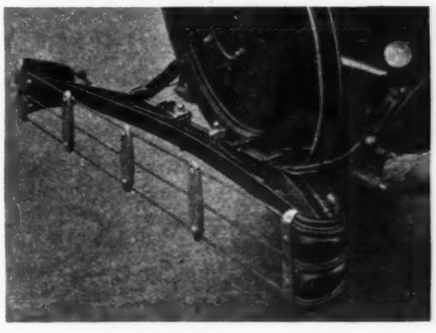
New Bosch Magneto Fitting for Fords

A NEW ignition system designed especially for Fords of 1919 and later, which are not equipped with generators, has been brought out by the American Bosch Magneto Co. Ford engines made since 1919 either are provided with a generator at the factory, or have provisions for mounting a generator. The Bosch company has taken advantage of this fact by making a simple fitting for mounting a Bosch magneto in place of the generator. It is only necessary to remove the generator adapter casting and to mesh the single gear of the new Bosch fitting with the cam shaft gear, bolting the fitting in place. It is not necessary to take off the radiator or do any complicated fitting. Fitting can be supplied with either of two types of Bosch magnetos—the DU or ZR.

Kosac Automatic Brake and Ignition Control

A DEVICE to serve the function of a bumper, but at the same time apply the brakes to a car and cut off the ignition when the car strikes a person or object has been brought out on the Pacific Coast by the Kosac Sales Co., San Francisco, Cal. The device consists of flexible contact bars, or cables, fastened by goose-necks to the front and to the rear of a car or truck. These contact bars, yielding to a pressure of only 15 lbs., complete the circuit with electrically wired contact points, in turn connected with the brake and ignition control, contained in a brass cylinder which rides freely with the brake rod, so as not to interfere with the foot or hand brakeing of the car under ordinary conditions. The slight pressure on the bars makes connection in a fraction of a second, setting the brakes, cutting off the ignition and blowing the horn.

The device works only in the direction in which the car is moving. For instance, if the car equipped with this brake and ignition control is parked, and another car bumps into it, either from in front or from behind, the horn of the bumped car starts blowing instantly, and blows until the pressure is removed. The speed at which the brakes are applied and the ignition cut off is three times as great as that at which any driver could move to set his brakes, cut off his ignition and blow his horn, it is claimed. In cases in which the driver does not wish the automatic control to work—such as in driving through brush, in passing another car on a country road when it is necessary to break through weed-grown edges of the highway, Kosac can be shut off from the dashboard by simply pressing a button.



MOTOR AGE

Reg. U. S. Pat. Off.
PUBLISHED EVERY THURSDAY

Copyright 1922 by The Class Journal Co.

Vol. XLI Thursday, June 1, 1922 No. 22

THE CLASS JOURNAL COMPANY

Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Beecroft, Directing Editor

Mallers Building, 59 East Madison Street, Chicago

BUSINESS DEPARTMENT
E. E. Haight, Manager

EDITORIAL
Clyde Jennings, Managing Editor
B. M. Ikert, Technical Editor

DETROIT OFFICE
J. Edward Schipper

WASHINGTON OFFICE
816 Fifteenth St., N. W.

BRANCH OFFICES
New York City—U. P. C. Building, 239 West 39th St., Phone Bryant 8760
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—536-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Indianapolis—1212 Merchants Bank Bldg. Ph. Circle 8426
Boston—185 Devonshire Street, Phone Congress 4336
Milwaukee—516 Colby-Abbott Bldg., Ph. Broadway 3528

Cable Address.....Motage, Chicago
Long Distance Telephone.....Randolph 6960

SUBSCRIPTION RATES
United States, Mexico and U. S. Possessions.....$3.00 per year
Canada ..... 5.00 per year
All Other Countries in Postal Union..... 6.00 per year
Single Copies.....35 cents
Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.
Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.
Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.

Can You Afford to Be Without— *Electrical Testing Devices?*

NOTHING stumps the average mechanic so much as shooting electrical troubles on a motor car. While it is true that we are getting today more and more specialized forms of service, whereby all electrical work is handled by a department set aside for it, engine work by men especially trained in this class of work, etc., it is equally true that in the smaller shops the men must be more and more of the all-around type of mechanic who can true up a commutator on a lathe and undercut the mica, as well as fit a new set of pistons in an engine.

The actual work of repairing a faulty electrical unit is not always as big a job as that of locating the trouble. An expert electrical man might know the peculiarities of all of the present-day electrical systems used on cars and thus be able to quickly locate a certain trouble. But how about the man not so well versed and who is often brought into contact with a case of trouble on a car of which there may be none or only few in his neighborhood? Is he going to have to tell the customer that he does not know what the trouble is, and that he had better take the car to some other place? No. In most cases he will make a try at it anyway, and try to convince the owner that he knows what he is talking about.

The work of such a man can be made vastly easier by the use of electrical testing devices which quickly and accurately tell him about the nature of the trouble. You cannot tell the condition of the plates in a battery by looking at the battery. Neither can you locate "shorts" in an armature that way. Nor can a mechanic quickly locate a "ground" or "open" in a circuit by a superficial examination of the wires and connections. He must have instruments to guide him. Instruments with dials and gages on them so the customer himself can see that the trouble has been located.

An inspector equipped with certain testing units will create a good impression on a customer whose car has come in with a faulty electric system, when he quickly applies various tests to circuits and gives the customer a ready answer as to the nature of the trouble and cost of repair. Contrast this with the man who tells the customer to "leave the car and we'll see what's wrong with it."

Unless you have a so-called "electrical shark" in your organization, we do not see how your shop can function a hundred per cent without the aid of good electrical test apparatus.

Your Show Windows

THE fundamentals of merchandising are so simple and so easy to understand that it is more than passing strange that so few persons make good merchants. An automotive accessory merchant and his wife spent considerable time window shopping in Chicago recently, and the wife was much taken with some of the show windows. The husband was a dutiful man, and he stopped and looked whenever the wife looked, and sometimes they talked about the windows.

Finally she said to him, "Jim, why don't you have that kind of displays in your store?"

Jim has a good store. It is clean. The help are courteous. The goods in the store are fairly well displayed and for some of his stock Jim has taken advantage of the research work in stock keeping that the hardware merchant has accomplished. Where small goods are stored in boxes, there is a sample on the outside of the box. This, as you know, is rather a forward step for an accessory merchant.

But Jim's windows deserve all that can be implied in the wife's question. His answer was about what you would expect. He said, "You know, dear, that we are not showing dresses or hats; we are showing automobile goods."

There is the whole story. Some one, some time, told Jim that his business was different, and he believed it. He has not yet got back to fundamentals of merchandising. It has not quite dawned on him that at first analysis he is just a merchant, selling goods with the hope of making money and that his problems in the main are merely those of any other merchant.

First he must attract the customer, then treat him politely, sell him articles that will satisfy him, and in this way win the repeat sale that will be the profitable one.

Older merchants than the automobile accessory dealers have been studying these questions for a long time. Department stores have high priced men who do nothing more than study the art of displaying goods. In the older lines of merchandise, the cluttered up or junk window has, as a rule, become the sign of a low grade store. The stores that regard show windows of great value use space for exploiting one article at a time.

There is a lesson in that for the automobile accessory dealer.

The windows of the large tire branches, where one tire is used so effectively, calls forth expressions of admiration

and attracts passersby to stop and study the tire. In the next block there often will be a tire store that uses the window space as a storage place for junk, and it serves to drive away customers. The lesson is obvious to any one who will stop to observe.

Why not some proper window dressing by automotive accessory dealers? Every one of these merchants has attended an automobile show and he has noticed how attractive to the general public are the displays of single objects, or related lines. He goes back to his store, where he has the facilities for duplicating the show display, and proceeds to put half of his stock in the window, and like enough he will put radiator ornaments and gear wheels on the same shelf.

Take the spark plug, for instance. A window display of a complete line of spark plug sizes, some samples of the materials from which they are made and a few cards giving some vital information about spark plugs, together with some reasons for buying the particular plug displayed would make an attractive and educative window. It would interest any one and would be a good advertisement for the store.

The next week there could be a tool kit display, with some explanation of tools. Then could come spot lights, with a few of them lighted at night. And so it could go. There is an endless variety of articles and a lot of people are interested in most of them.

Really, now, why can't we change some of these junk heaps at the front of the store into educative advertisements. The day of the dirty red bunting and piles of miscellaneous merchandise in weather-worn boxes has passed.

The Association Spirit

WHAT is an association for? How can an association help me? are two very frequent questions you hear from men who have been only slightly stung by the association bee. Those who have not been touched at all by the bee simply dismiss the entire question. The view of this latter class is that their business is above the average, and they will give more than they will receive. As a rule, these men are too selfish to help their fellowman.

But the man who has been slightly stung is in a serious quandry. In most cases he is a man who can entertain you for hours, telling you what is the matter with business in general and his line in particular. He is frequently picturesque in his descriptions and always forceful in his statements. But his premise is wrong, just as is the premise of the class who are positive that associations cannot help them.

These men, as a rule, think that the chief trouble with business is that all of the other establishments do not conduct business exactly as they do. They do not get the idea that, although they are successful, they probably do some things very crudely and waste a lot of effort and money. They do not get the idea that some much smaller establishment may do some things much better and that this man might be quite willing to tell about it.

The answer is in the association spirit. Many associations are started and a few do good work. Most associations that do not succeed never get the spirit. This is an intangible thing and must be developed. It is quite likely that it will not develop in the first meeting, usually it requires some time to get the idea across. First, the members must get acquainted. A man never talks freely until he thinks he is among friends. Several meetings are required before competitive business men get that feeling. It is probable that before the first meeting some of them were not only unacquainted, but they believed that they did not want to know each other. Once a contact is formed, this sentiment undergoes a revision. Rivals in business can be friendly and they can talk over affairs of common interest to mutual advantage.

An association can do two things for you. It can help you to advance your business interests by extending to you the opportunity to advance the standard of business generally; and it can offer to you the advantages of building up the weak points in your own business by taking advantage of the experience of your neighbors.

Once the association spirit is properly developed, the association will not die. But an association founded for the purpose of immediate profit from its activities never will be a helpful organization.

Looking Ahead

IT IS significant that the Ford Motor Co. in explaining the present unprecedented demand for Ford cars, says that this is the result of persistent sales effort during the recent lean months. The statement goes on to say that the present sales are merely the closing of sales made months ago.

This is quite a timely suggestion. It is a proper application of the real theory of all advertising, and sales is a part of advertising or advertising is a part of sales, whichever subject you have uppermost in your mind. The two are the same thing. It was this idea that caused an advertising man to coin the phrase, "The scarcer the worms, the harder the hen scratches."

It is an application of the familiar phrase of some time ago of, "In time of peace prepare for war," and the corollary, "In the time of war prepare for peace."

Now that sales are at high tide, how many dealers are preparing for the lean months that may follow? How many distributors are building up an adequate sales force by permitting small dealers to have a proper proportion of their cars? How many dealers are taking advantage of the present circumstances to check the high trade-in price? How many accessory dealers are being sufficiently careful of the merchandise they handle to build up a reputation for the future? Repeat the last question for tire dealers.

A period of easy sales always brings to the front a lot of unworthy merchandise. It requires some moral strength to resist the temptation to make a few easy dollars by handling some of this, but the period of easy sales is the best time in the world to build a reputation that will take care of the later period.

Stop, Look, Listen—should be today's watchword.

A Need of Motor Organization

NO BETTER illustration is needed to prove the necessity of motor organization and to show that foolish laws bring about retaliation than is found in the war now being staged between Maine and Massachusetts over trucks. This year Maine put into effect a law preventing trucks from other states from using the Maine highways unless registered there. And the fees are the same as in Massachusetts, $10 a ton. A temporary registration for five days may be taken out for 25 per cent of the fee.

Last week a number of Maine inspectors stopped all trucks from other states; in this instance they happened to be all Massachusetts trucks. Drivers were told they could not proceed, and it necessitated delays and expense. The Massuchetts motor commissioner, learning of this incident, sent word to all his inspectors to hold up Maine trucks, and that same day the Maine trucks in Massachusetts were stopped.

Orders in Hand for a Big June

Production Will Continue At Capacity Through Month

Sales In Third Quarter Expected to Show No Material Reduction in Volume

NEW YORK, May 29—Most passenger car companies have endeavored to speed up operations in the final week of May in an attempt to establish new production marks and offset the loss of output on Memorial day. June will bring no slackening of activities, for a flood of orders still is flowing into the plants. If the second quarter is not the largest ever recorded for passenger car production it will be close to it.

Less than a month ago it was generally expected that the third quarter would bring a seasonal decline in sales, but the industry now is becoming content that there will be no material falling off. Evidence is accumulating that the third quarter will be about on a par with the second. It can be no better, for the passenger car and has been operating at capacity since the end of March. The results will depend largely upon the farm market and conditions in the south. There are strong indications of large sales in the agricultural sections when the harvests begin and there already is considerable demand in these districts.

Truck production is increasing month by month, although improvement has not been as spectacular as in the passenger car field. Sales are likely to increase steadily until November, at least. More farmers than ever before are considering the purchase of commercial vehicles and many of those now in operation will be replaced as soon as possible.

Nearly all parts plants are operating at capacity and a considerable proportion are embodying day and night shifts. Sales in April showed a gain of 20 per cent over March and May probably will record another equally large expansion in business. Some vehicle manufacturers still are handicapped by a shortage of essential parts and materials.

Nearly all large passenger car producers report a steadily increasing call for enclosed models. Several new models or additions to established lines have been brought out recently and more are in prospect. If there is any tendency for demand to slacken in the early fall, new models are expected to revivify it.

The reductions in freight rates will result in important savings for automotive manufacturers on shipments of all materials except completed vehicles. The freight saving on these will be passed on to the consumer. The lower rates will tend to offset recent advances in the cost of supplies.

Virtually all tire factories are running full blast, but there are many indications that a price war is imminent. Tires are being made at a much smaller margin of profit and if there is an era of intense price competition the results may be serious for some makers. Reductions averaging from 10 per cent to 15 per cent have been general in the last month. Some of them have been camouflaged, but the result is the same so far as the consumer is concerned.

Farmers Buying Most Overlands

TOLEDO, O., May 29—A statement issued by Willys-Overland, Inc., says that the company's records show that in April the purchase of Overland cars by farmers were almost double the purchases by any other vocation. Salesmen, laborers, merchants ranked next in order, each group buying approximately the same number of cars. Clerks were fifth with approximately one fourth as many cars as were purchased by farmers.

The officials of the company interprets this as showing that the farmer is again becoming a substantial factor in the automobile business.

TOURIST CAMP GROUND DIRECTORY

Waterloo, Iowa, May 27—The United States Touring Information Bureau, under the direction of W. B. Strothman, with offices in this city, has published a tourists' camp ground directory and road map of the United States which is to be placed on the retail market. The automobile highways are shown in red and the various named routes are designated by number. The legend also illustrates the various markings of the named routes. The camping sites are indicated by green stars. There is also an alphabetical list by states of the towns where camping grounds are located, with a brief description of the town and camp site. This description tells what conveniences are available at the camp ground and whether or not it is free.

A. E. A. FOREIGN TRADE COMMITTEE

Chicago, May 30—A foreign trade committee composed of the following has been appointed by the Automotive Equipment Assn.: S. D. Black of Black & Decker Co., Baltimore, Md., Chairman; N. H. Oliver of Metal Specialties Mfg. Co., Chicago, Vice Chairman; F. B. Caswell of the Champion Spark Plug Co., Toledo.

"UTILITY WAGON" LENGTHENED

Buffalo, N. Y., May 27—The Stewart Motor Corp. has lengthened the wheelbase of its Utility Wagon, Model 14, from 123 to 128 inches. The tire size all around has been increased from 32 x 4½ to 34 x 4½ inches.

Good Prospects for June In 19 Cities of Illinois

Increase in Sales This Year As High As 400 Per Cent Over Corresponding Period Last Year

PEORIA, ILL., May 31—A survey of the automobile retail business in 19 cities of Illinois made by the Illinois Automotive Trade Assn. shows that there has been a great improvement in sales this year and that prospects are good for June.

Dealers in Monmouth report that business in April was 400 per cent better than in April last year. Other cities report 50 to 100 per cent improvement. Only one city, Streator, reports that April business was not as good as in April last year.

"Excellent" to "Little Change"

Prospects for June were said to be "excellent" in Peoria, "very good" in Kewanee and Lincoln, "25 per cent better" in Quincy, "better" in Springfield, "good" in Monmouth, Streator, Alton, Belleville, Bloomington, Canton, Chicago, Danville, Dixon, Elgin and Freeport; "fair" in Galesburg and Aledo; "little change" in Kankakee.

The survey also covered trucks, used cars and credit. In most of the cities the truck business was reported as only "fair."

The used car business was reported good in most of the cities. Credit conditions were reported variously from "bad" to "much improvement."

The survey was prepared by F. C. Zillman.

Wing Motors Corp. Formed to Manufacture $1,800 Car

Binghampton, N. Y., May 26—The Wing Motors Corp. is incorporated under the laws of Delaware for $10,000,000 to establish a plant in the city of Binghampton for the manufacture of the Wing automobile, the principal feature of which is the front spring suspension, two springs being placed between the two forward wheels in line with the axle instead of in line with chassis. A Continental six cylinder engine is used and other parts are standard. The car is designed to sell for about $1,800.

THE SIX MILLIONTH FORD

Detroit, May 27—The Ford Motor Co.'s production of cars and trucks passed the 6,000,000 mark on May 18, the factory announces. Of this total, 5,517,956 cars and trucks were delivered in the United States and the company claims that 4,000,000 of these are still in service. The daily production of all the Ford plants is now nearly 5,000.

Minnesota Expects 500,000 Tourists

281,066 Ford Cars and Trucks Made in 4 Months

Increase is 55,850 Over Corresponding Period Last Year—Detroit Plant Leads

DETROIT, May 29—Production in Ford American and foreign plants for the first four months of this year, excluding the Ford Canadian plant, is 281,066 cars and trucks, an increased business of 55,850 over the corresponding period of last year. Demand in the United States and abroad is running a month ahead of former business; indicated by the fact that April business of this year approximated that of May of last year.

Total production of all plants for April was 111,944 cars and trucks, the output of the Ford Motor Co. of Canada being 5,608 cars and trucks and the output of the company's foreign plants, 5,904. The Canadian plant showed an increased output over that of March by 600 cars and trucks.

Detroit First

Detroit ranked first in assembly of all United States branches with a record of 11,155 cars and trucks. The Kearny, N. J. plant with 11,125 was second and Philadelphia, Chicago and Buffalo ranked in that order in the first five producing branches.

At the River Rouge 7,445 tractors were built during April, a considerable increase over the April, 1921, total. Cork, Ireland, tractor plant built 121 Fordsons. Total Fordson production up to the close of April was 15,966 which compared with 13,470 for the corresponding period in 1921. Production of tractors is expected to continue at the rate of 400 daily.

Wood wheel production at the Hamilton, O., plant of the Ford Motor Co., reached 200 sets daily early in April and this schedule has been increased steadily so that by May 1 a schedule of 600 sets each 16 hours was reached. Facilities at the plant will be gradually extended until a capacity of 2,000 sets daily is reached.

The dry kilns at this plant were completed in May and complete conveyor systems installed so that all handling of material is done mechanically. New units will be added to the plant to meet the requirements of the increased production planned. All of the parts for the manufacture of the complete wheel will be built and assembled here.

In addition to the wheel construction, the Hamilton plant is building 7,000 touring car locks daily. Machinery for the manufacture of sedan and coupe door locks is being completed and will permit this plant to supply all of the locks for the enclosed cars.

MEMORIAL TO BATCHELDER

Summit, N. J., May 27.—A tract of 10,000 acres of land on top of Baltusrol Mountain has been dedicated as Batchelder Park in memory of the late Amos G. Batchelder, for many years secretary of the American Automobile Assn., who was killed in an army ambulance airplane crash at Indian Head, Md., May 28, 1921. Part of the property was the home of Batchelder and is now occupied by his wife and daughter.

SALES DECLINE IN DALLAS

Dallas, Tex., May 29—Actual retail sales of automobiles for the first half of May showed a decrease of some 10 per cent when compared to the same period of the preceding months. Heavy and disastrous floods and continued rains in the district were assigned as a reason for decrease in sales. Tire business also suffered a slight slump, as did accessories. Truck business was not up to standard basis and trailers were not selling. Garagemen said their business held its own.

NO DECISION BY NATIONAL

New York, May 27—Stockholders of the National Motor Car & Vehicle Corp. of Indianapolis decided at a special meeting held at the corporate office here to refer back to the board of directors for further investigation the proposal to merge with Associated Motors Industries. Another special meeting will be called later to determine what shall be done.

USED CAR DEALER HOLDS AUCTION

Chicago, May 29—A Chicago used car dealer who reports good business both in the maintenance and sales departments of his establishment, has rented space in a street carnival near his place of business. At his stand, the dealer has a number of the cars from his rooms on display and each night auctions a car to the highest bidder.

Dealers See Opportunity to Serve Automobile Travelers

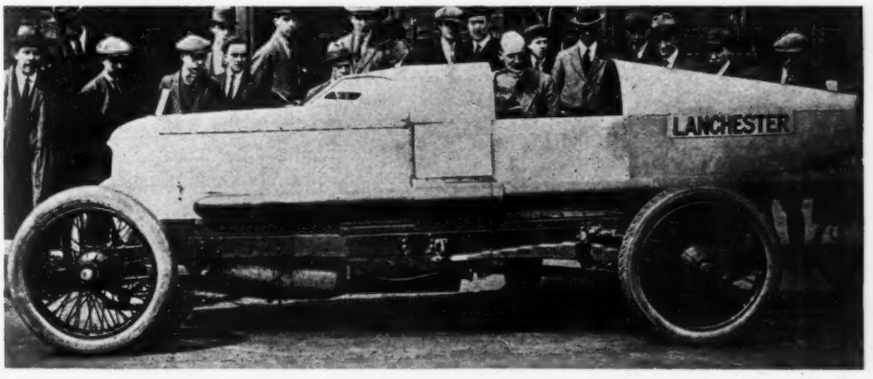
Many Organizations Working to Bring Summer Visitors to State During Vacation Period

MINNEAPOLIS, May 30—Automobile dealers, garage owners, repairmen, accessories stores, and gas and oil station men are expecting a heavy business this summer due to the combined efforts being made by various organizations and trail associations to bring 500,000 automobile tourists to the state of Minnesota for the summer season.

The 10,000 Lakes Association, headquarters in St. Paul, has already listed 150 towns with tourist camps having various facilities, up to even shower baths. The Yellowstone Trail Association has opened headquarters in the best hotel in Minneapolis to steer tourists over that route westward. Other trail associations covering the state are busily engaged in routing people. The municipal welcome bureau of Minneapolis, backed by the mayor and the police department, has opened for another year in the town house of the Automobile Club. The Minneapolis Journal has established an information bureau for tourists covering the whole state. All this service is free.

Beside the several established trails already listed in the automobile books, the Twin City West Trail Assn. has been formed at Hutchinson, Minn., to promote an entirely new highway to the Yellowstone National Park from the Twin Cities at Mount, St. Bonifacius, Silver Lake, Hutchinson, Thorpo, Montevideo, Dawson and Madison, Minn., said to be 300 miles shorter than competing routes. H. R. Kurth of Hutchinson is president and S. C. Peterson is secretary. The red flag is the emblem.

New Lanchester Racing Car



LONDON, May 15—The new Lanchester racing car, which is entered in many of the English classics, has a number of novel features. The driver is entirely covered in. A series of boxes run through the body from engine to tail through which the hot air is carried off.

May Better Than April in Chicago Automotive Industry

Production and Retail Sales Have Steadily Increased, Reaching Highest Point of Year

CHICAGO, May 30—"Better than April and probably as good as any month in the history of the automotive industry." This sums up the progress of business in May from the standpoint of retailers, wholesalers and manufacturers engaged in the automotive industry in Chicago.

Retail sales of automobiles exceeded the sales in April which were unusually good. Members of the Automobile Trade Assn. say that car sales have increased steadily up to the present. Some dealers have run short, especially of enclosed cars. The largest demand continues to be for the low and medium priced cars of established reputation. Cars costing more than $2,000 are selling well, but not so well in proportion as the lower priced cars. Dealers say that a remarkable proportion of higher priced cars are being sold for cash.

Figures compiled by the Central Automobile Financing Association show an increase in the number of sales week by week throughout the month. These figures show the number of chattel mortgages filed each week against cars sold on time payments. Such sales are estimated to constitute approximately 60 per cent of the total sales. For the week ending May 20, the latest for which figures are available, the time payment sales were 1,136. Figures for other weeks were: 1,088 for the week ending May 13; 898 for the week ending May 6, and 899 for the week ending April 29. The highest figure for any previous week this year was 1,043 for the week ending April 1.

Representative members of the Association of Automotive Equipment Manufacturers report that the volume of business is steadily gaining and that production is proceeding in most cases at capacity. Truck manufacturers are increasing production. One large maker reports that production for the first four months of this year was 55 per cent greater than for the corresponding period of last year. The same company has a maintenance department which is unusually busy.

Large numbers of trucks which have been idle are being brought in and put in serviceable condition under factory supervision. In the opinion of factory officials this indicates a revival of business in general, requiring trucks for transportation, and also a spirit of economy on the part of truck users who want to get all the service possible out of the trucks they have on hand.

The truck market in Chicago is particularly active with considerable demand from large business houses and from contractors. Some of the large fleets are being materially recruited.

Railroad to Try Out Four Makes of Gasoline Cars

St. Paul, May 27—As the first step in a determined effort to meet the competition of highway motor transportation, the initial purchase of four rail motor buses by the Great Northern Railroad is announced by President Budd. One of the buses will be alloted to each of the four main divisions of the railroad, and they will be placed in operation within six weeks.

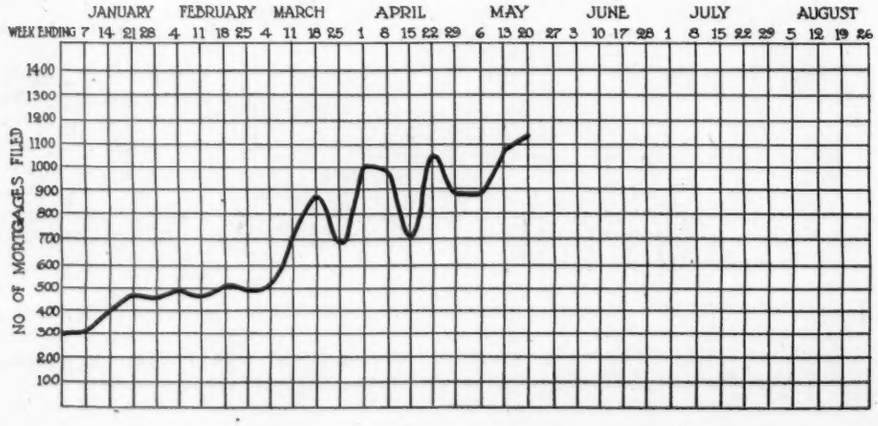
The Great Northern will operate two buses on Minnesota lines and the other two in Washington and in Montana. Manufacturers of rail cars will be placed in competition in the experiment to determine which will provide the most satisfactory and most economical service, as the railroad has ordered one Mack, one Service, one White and one Four Wheel Drive.

"The railroads must meet motor bus competition," said President Budd. "We will use the rail buses wherever they will afford the best opportunity."

CONFERENCE ON HEADLIGHTS

New York, May 29.—Highway departments of 10 eastern states will send representatives to Baltimore July 17, to adopt, if possible, uniform lighting regulations. Some of the states now favor the present Massachusetts headlight law.

How Time Sales Show Improvement of Automobile Industry in Chicago



Recovery of Automobile Business Rapid in South

Atlanta Dealers Behind With Deliveries—High Point Reached in Florida

ATLANTA, Ga., May 31—Automotive sales conditions in the southeastern territory have improved so rapidly during the past six weeks that a majority of the dealers and distributors are of the opinion that the period of business depression has now definitely become a thing of the past. All signs indicate returning to normal, and with some dealers business now is even better than normal.

The Atlanta branch of the Ford Motor Co. reports the past two months the best in the history of the branch, and practically all of the Ford dealers in the larger cities of this section are from two to four weeks behind with their orders. The Atlanta branch of the company is now building an average of 100 cars daily, but cannot keep up with demand. The larger Atlanta Ford dealers, A. L. Belle Isle, the Beaudry Motor Co. and David T. Bussey, all state that they are several weeks behind in filling the orders now in hand.

In Florida practically all makes of cars are in excellent demand, with gross business appearing to be about 10 per cent better than it ever has been.

The Atlanta branch of the Buick company reports the sales volume having increased more than 200 per cent the past six months.

ALLEN SALE JUNE 27

Columbus, May 30—Failing to sell the assets, including plant and good will, of the Allan Motor Co., the receivers, W. C. Willard and George A. Archer, have obtained another order from the U. S. District Court for the sale of the property at public auction June 27 at 9 a. m. at the Columbus plant on Dublin avenue. The assets consist of the plant at Columbus, the Bucyrus (Ohio) plant and several parcels of real estate at that place, the exclusive rights to the Allen service, furnishing parts and using the name Allen, materials on hand and equipment in all of the plants and other tangible assets. Upon a former occasion a bid of $570,000 for the property was accepted, but the bidder failed to complete the deal.

VELIE CIRCUIT SHOWS

Moline, Ill., May 29.—The Velie Motors Corp. announces a plan for distributors to give special exhibitions of Velie cars in co-operation with the various dealers in their territories. A convenient location is selected and there the new Velie cars are displayed for a limited time with all the attractive surroundings that would be provided at a regular automobile show. The exhibition usually includes the demonstration of the engine in operation.

"Saturday Ain't No Day to Work," Slogan to Aid Sales

Manufacturer Launches Association to Encourage All-Day Touring by Automobile Owners

CHICAGO, May 27—"Saturday Ain't No Day to Work," is the motto of a new summer sales promotion plan devised and copyrighted by the Advance Automobile Accessories Corp. of Chicago and given by it to dealers throughout the country who will agree to organize local branches of the "Saturday Ain't No Day to Work Assn."

The idea is to encourage all-day touring on Saturdays by automobile owners. The association is described as a national association for motor car owners without dues or fees. The only membership requirement is a pledge to do no heavier work on Saturday than changing a tire. Dealers who qualify are appointed official headquarters for their community and are provided with membership emblems which they distribute free to members. The emblem is of metal and may be attached to the radiator. The name of the association is in red letters in a white circular field around the margin of the emblem. In white letters on a red field in the center are the words, "Let's Go."

The plan is described in full in the May issue of "Let's Go," the house organ of the Advance Corp. In a paragraph addressed to dealers, the publication says: "This is a high grade business proposition. By this method you get the cars on the road and you know one car on the road is worth 1000 in the garage. The cars need something to go on a trip, and they need more when they get back."

The dealer who enrolls members will get the name and address and kind of car owned by each and will thus have a valuable list of present or prospective customers. The general manager of the "Saturday Ain't No Day to Work Assn." is Arthur Stringer, 1721 Prairie avenue, Chicago.

TO STUDY FUEL PROBLEM

New York, May 29—The following committee has been appointed to serve with Dr. Van H. Manning, director of research of the American Petroleum Institute, to take up various research problems with the aim of insuring an adequate future fuel supply for motor vehicles: W. F. Faragher, chairman, Mellon Institute, Pittsburgh, Pa.; R. E. Wilson, Massachusetts Institute of Technology, Cambridge, Mass.; R. P. Anderson, United Natural Gas Co., Oil City, Pa.; N. A. C. Smith, Bureau of Mines, Pittsburgh; C. E. Waters, Bureau of Standards, Washington; R. R. Matthews, Roxana Petroleum Co., Wood River, Ill., and E. W. Dean, Standard Oil Co., 26 Broadway, New York.

BROOKLYN "ASK 'EM TO BUY" MEET

New York, May 27—Automotive equipment jobbers of Brooklyn will hold a big "Ask 'Em to Buy" meeting at Kismet Temple, Brooklyn, on June 2. Martin Evans Co., Auto Supply Co., E. Krieger & Son and the Ready Auto Supply Co. are sponsoring the project. James A. Dunne, judge of the Municipal Court, will preside, and Ray W. Sherman, merchandising director of the Automotive Equipment Assn., will make the principal address. The address will be followed by the A. E. A. film "Ask 'Em to Buy" and music and vaudeville will also be presented. Ten thousand tickets have been printed, of which 5,000 will be distributed to garages and repair shops in Brooklyn and Long Island, and the other 5,000 will be distributed by the four concerns sponsoring the project.

Westinghouse Increases Force to 2,600 at Springfield, Mass.

Springfield, Mass., May 27—Westinghouse Electric & Manufacturing Co. has increased its operating force here to 2,600, of which number 2,000 have been taken on since the first of the year. The automotive equipment and radio departments are running at maximum, and the farm lighting department has shown a marked gain, indicative of the improved farm situation in the Central West.

New fuse box, ignition and cutout devices are being made ready for production. It is stated that production of starting, lighting and ignition units during May will be triple that of April. Contracts have been closed for 20,000 sets for the Gray car, to be delivered at the rate of 1,200 a month, 20,000 for the Gardner car, 15,000 for the Hupmobile, 15,000 for the Velie, and 2,500 for the American motor truck.

Continental Motors has placed an order with the company for $150,000 worth of Micarta gears. Many other manufacturers' orders are being received, and a steadily increasing market demand for replacements is reported, so that the prospect for the balance of the year is very promising.

POWER FARMING CAMPAIGN

Washington, May 29.—A comprehensive, progressive farming campaign, to include 17,000 farm implement dealers from coast to coast and extending back to the manufacturers of mechanical farm power equipment through the National Institute of Progressive Farming, was laid down here in a conference between Director Guy H. Hall of the Institute and the Department of Agriculture.

Accompanying Hall was a committee composed of the heads of leading manufacturing concerns of the middle west, including Finley P. Mount, president of the Advance-Rumely Co.; J. B. Bartholomew, president of the Avery Co., and Floyd R. Todd, of the John Deere Co. Hall's committee first conferred with Secretary Wallace of the Department of Agriculture and then held conferences with the bureaus of Farm Engineering and Animal Husbandry.

Used Car Business Vital To Industry, Says Dealer

Should Be Put on Dignified Basis With Salesmen as Capable as Those Selling New Cars

NEW ORLEANS, May 29—President Fred Perkins of the Capital City Auto Co., Studebaker distributors, has invested $80,000 in real estate 51 feet front and 165 feet deep to provide space for exhibiting used cars. This addition gives the Capital company a total of 102 feet front on St. Charles street, the most frequented automobile thoroughfare in New Orleans and brings its total floor area to 62,000 square feet. The site has a wide alley for rear entrance to the stock rooms and service station. The construction of the new building will be completed in September.

"For years past," Perkins said, "many of the automobile dealers have fought the used car and some of them have tried hard to get rid of the business.

"I see no use in fighting against something that is as vital to the automobile industry as the money made at the mint. It is a system of exchange that is necessary and should be placed on as dignified a basis as possible.

"The time has arrived when the automotive merchant must present the used car on the same high plane as the new car. They should be sold by the same class of salesmen as the new cars and in equally pleasant surroundings. The dealer who cannot see the wisdom of this may find himself relegated to a rear seat, for trading automobiles will go on just as long as automobiles are manufactured."

The Capital City Automobile Co., organized 13 years ago at Baton Rouge, by Fred Perkins and Joseph Gottlieb, a banker, with a capital of $2,800, now has a capital of more than $50,000 and operates here and at Baton Rouge and has sub-dealers all over Louisiana.

DEALERS EMPLOY APPRAISER

Bloomington, Ill., May 27—Working out in detail its plan for the central appraisal system for used automobiles, the Bloomington Automobile Dealers' Assn. has engaged Jesse Siegfried to serve as expert appraiser and to give his full time to the business. He is to be allowed $5 for every car appraised which figures in a deal either for a new car or for the exchange of another used car. If the deal is not made no fee is paid. The dealer who makes the deal pays the fee. Reports of last year's business show that Bloomington dealers took in approximately 1,000 used cars and if as many cars are taken in this year the appraiser will receive about $5,000 in fees.

CHANDLER SALES PASS 1921

Cleveland, May 27.—The Chandler Automobile Co. reports that in the third week of May sales in 1922 reached and passed the total for 1921.

Says Legislatures Are Chief Hindrance to Truck Progress

New York Salesmanager Urges Uniform Vehicle Law Instead of Many Restrictive Measures

PHILADELPHIA, May 27—At the May meeting of the Motor Truck Assn. of Philadelphia, Dr. J. T. W. Kastendieck, general truck salesmanager of the Packard Motor Car Co., of New York, was the speaker. He treated the truck industry from various angles, including that of the owner, the legislator and the dealer. Dr. Kastendieck, after stating that the transportation demands during the war fully proved the utility of the motor truck, which "splendidly delivered its load," asserted that reaction, due to the necessity of sudden readjustment, found manufacturers tooled up to a production exceeding demand with a supply of finished product in excess of the market, and a stock of material and lists of employes far in excess of needs.

"Inadequate roads, never intended to carry the increase in traffic, were wholly or in part destroyed or damaged," said Dr. Kastendieck, "and legislators, through the highway departments, called on to provide for repair, and finding treasuries depleted, set up a program of taxation and restrictive legislation. These evils must be met with patience and good judgment, if we are to return with permanence to a sound business basis. The public, the owner, the manufacturer, the dealer and trade organizations, working with the transportation interests and legislative bodies, must cooperate to secure the correction of these evils.

"Square Deal"

"There must be a square deal for the public," continued Dr. Kastendieck. "The owner may find that the high allowance for his used vehicle was a false bargain and that encouragement of overallowance has reacted on his own kind of business. Discounts based on the price the buyer is willing to pay and having no regard for the value of the purchase or its cost is a pernicious practice, and if persisted in, leads to failure; or if provided for in an inflated list price, constitutes business gambling and is not sound business practice. The buyer may chuckle and feel well pleased at a high allowance for the remains of what was once designated by the name of a motor truck, but for which any self-respecting junk man would hesitate to give $50; but the buyer already is beginning to realize that somebody always pays the freight and that such practice is bound to lead to disaster. The wonderful bargain may become an orphan.

"Reputable parts manufacturers are now exercising a careful discrimination based upon experience and the truck buyer may well exercise a like discrimination and analyze his proposition. Today we find some railroads seeking to apply the motor omnibus principle to their short lines. Tomorrow, possibly, it will be found more economical to tear up the tracks and operate motor truck transportation in place thereof. This thought was exercised by C. A. Morse, of the United States Railroad Administration. Store door delivery is still in the minds of railway administrators.

"Electric railways are learning of the possibilities of motor busses as feeders to truck lines and this affords another field for motor truck sales operations.

"The most serious interference with progress in motor truck expansion is legislative. This interference is made more serious because there is first, a lack of understanding in some quarters, of the fundamental principles underlying successful motor freight transportation; and second, because of business conditions and third, because there is an economic basis that lends plausibility to the restrictions.

"The inconvenience of the differences in the laws of several states and the strict adherence to the letter of these laws will finally be obviated by a uniform vehicle law, toward the building up of which and the provisions of which all motor truck associations should direct their activities."

Automobile Finance Men to Meet at Indianapolis June 7

Indianapolis, May 29 — Arrangements have been completed for a meeting of the National Association of Automobile Financing Companies at Indianapolis on June 7, which is one of the days set for the convention of the National Association of Credit Men. The constitution and by-laws of the Financing Association will be offered for approval at the meeting, the business session of which will be held at the Columbia Club. There will be a banquet at the Claypool Hotel in the evening, at which the speakers will be Charles A. Bookwalter, Walter E. Heller, Henry Warrum, Fred A. Weber, Jr., and C. C. Stratton.

Members who attend the meeting will be able to avail themselves of the special railroad rates offered for the convention of the National Association of Credit Men.

The arrangements for the meeting have been made by the Indianapolis national association. Various problems of vital importance to the national organization will be considered and a strong effort will be made to increase the membership.

MICHELIN TIRES REDUCED

Milltown, N. J., May 27—The Michelin Tire Co. announces substantial reductions in its fabric casings. Some of the cuts are:

SOFT BEAD CLINCHER TYPE

Size	Old Price	New Price
30 x 3	$12.90	$10.90
30 x 3½	14.90	12.75

STRAIGHT SIDE TYPE

Size	Old Price	New Price
32 x 4	$26.90	$23.25
33 x 4	27.90	23.80
34 x 4	28.90	24.90

Grand Prix Race to Use American Track Methods

Speed Contest Also to Be Held With Cars Carrying Limited Amount of Gasoline

PARIS, May 12—American track methods will be adopted in the start of the French Grand Prix road race for 122 cu. in. cars near Strasbourg on July 15. The triangular course being prepared for this race is 8.3 miles round. There will be 22 starters, and 60 laps will have to be covered, giving a total distance of 498 miles. By an understanding with the drivers, many of whom have had experience at the Indianapolis track, the start will be made in a group, the cars being lined up in line of three, according to positions decided by the drawing of lots.

This will be the first time that a grouped start has been given in a European road race, and the change has only been made possible by experience gained on American tracks. By reason of this method of starting, timing operations will be confined to recording the number of laps covered.

Another feature of this race will be that many cars will start without a spare wheel, the drivers being prepared to run a lap on the rim if they burst or puncture just after passing the pits. This again is the result of American experience.

Speed Contest

In addition to the 122 cu. in. race, there will be a speed contest over the same course, on July 16, for four-passenger cars given a limited amount of gasoline at the rate of 13.7 miles to the American gallon. This is not a stock car race, and, while there are no restrictions concerning the engine, minimum body dimensions are indicated and there must be four seats of given dimensions. Only the driver will be allowed aboard the car, but the equivalent weight of three other persons, at the rate of 154 pounds per passenger, must be carried in the form of ballast. No outside assistance of any kind must be given, nor can supplies of any kind be taken aboard during the race. This will oblige the competitors to carry with them all the tires they require in the race, without, however, having the liberty of putting spares in the places reserved for passengers.

The gasoline supply will be measured out on the day before the race, the tanks sealed, and the cars left under military guard in locked boxes until half an hour before the start of the race. They will then be pushed into the road, grouped according to positions determined by the drawing of lots, and the drivers will be lined upon the side of the road. When the official signal is given to start the race, the drivers will be allowed to run to their cars and will be required to start up with the electric starter. The starting crank will be in the tool box and will not be allowed to be brought out unless the electric starter fails to respond.

Firestone Operating Profit of $2,500,000 for 6 Months

Factory Now Producing 25,000 Casings a Day—To Build Canadian Plant

AKRON, O., May 27—The Firestone Tire & Rubber Co. expects to start work soon, it is reported, on a new tire building plant at Hamilton, Ont. Firestone secured the site for the Canadian plant during the war but deferred building operations. Under present plans the Canadian plant will have an initial capacity of 3500 tires daily.

The Firestone factory in Akron is now producing 25,000 tires a day. Miller Rubber Co. is running in excess of its 1920 peak of 6000 tires a day. Firestone's peak was 28,500 casings daily.

For the first six months of the Firestone fiscal year which began Nov. 1, an operating profit of approximately $2,500,000 is reported. This includes the six month period up to May 1 and does not cover the past 60 days during which the tire industry has taken an unprecedented spurt, indicating that the Firestone operating profit for the next six month period will be proportionately much larger.

This substantial operating profit does not necessarily mean resumption of divident payments, it is understood, as the company at the end of its last fiscal year had $21,000,000 in notes and acceptances payable, to which net profit will have to be applied. Last year the Firestone company wrote off approximately $16,000,000 in commitment losses and inventories.

CASE REDUCED $100

Racine, May 22—The Case Threshing Machine Co. announces reductions on both its open and enclosed types of Model X. The 5 passenger phaeton formerly quoted $1890 is now priced at $1790 and the sedan, formerly listed at $2790, now sells for $2690. A roadster priced at $1750 and a brougham at $2550, this model, are now being brought out.

The company has replaced its model V with a new model to be known as W. The 7-passenger phaeton is priced at $2250, the 5-passenger or sport roadster at $2200, the coupte at $2850 and the 7-passenger sedan at $3250.

BANQUET FOR HARDY

Detroit, May 26—A. B. C. Hardy, president and general manager of Olds Motor Works, was given a banquet on his first anniversary as chief executive of the company by the factory organization. An autographed silver framed testimonial of appreciation of his leadership and service was given him.

ROLLS-ROYCE INCREASES OUTPUT

Springfield, Mass., May 29—Orders are running ahead of production at the Rolls-Royce plant here and an increased rate of output for June is scheduled, notwithstanding the big May expansion. The company has leased the large six-story factory building of the Knox Motors Co. here, to be used for the manufacture of Rolls-Royce bodies. This branch of production is being organized under George W. Kerr, superintendent of coach work, and it is expected the plant will be in full operation by the latter part of June.

Packard Reaches Highest Point; Orders Exceed Output

Detroit, May 27—Packard Motor Car Co. is now at the highest production and sales point of its career, said President Alvan Macauley in a signed statement this week. New orders are developing in increasing volume, the statement said, and indications are that the peak has not been reached.

Orders are already on hand for three times as many cars as the factory is capable of turning out for immediate delivery, the statement declared. Additional employees have been added at the rate of 120 a day so that the payroll now numbers nearly 7000 as compared with 3300 a year ago.

Sales records show a total of 2000 orders for the new Single Six in April as compared to 304 orders for the Single Six in April last year. Deliveries of twin-six were reported exceeding the year previous by 100 and truck business showed an increase corresponding to the twin-six.

N. A. C. C. ELECTION

New York, May 27—The annual meeting of the National Automobile Chamber of Commerce to elect successors to the directors whose terms have expired will be held at headquarters in this city June 7. The directors whose places will be filled are H. H. Rice, J. Walter Drake, C. C. Hanch, John N. Willys and Roy D. Chapin. It is probable they will be re-elected. In addition to the election, there will be a general discussion of what is in prospect for the industry for the remainder of the year.

INVENTOR GETS $154,816

Boston, May 29—A jury in Federal district court has awarded Rollin Abell, of Milton, a mechanical engineer, a verdict of $154,816 in his suit against the General Motors Corp. for breach of contract. According to Abell's attorney, the engineer entered into a contract with the corporation under which it was agreed that General Motors should take a patent applying to the cylinder valves of automobile engines and pay Abell a minimum of $50,000 a year for three years if they took a contract with the non-exclusive license for the use of the patent. The corporation argued that it had not agreed to contract for the license.

HEAVY ORDERS FOR VISORS

Philadelphia, May 27—There is a brisk inquiry for automotive equipment here, especially in the line of windshields and visors. Orders are increasing steadily.

Detroit Air-Cooled Car Scheduled For Production

President of Company Announces Quantity Manufacture Will Begin in 90 Days

DETROIT, May 27—Production of the Detroit Air-Cooled car will be started in 90 days, according to a statement by W. J. Doughty, president of the company. Bids for material and parts are being sought in 1000 lot quantities, with a possibility of requisitions being made for 5000 complete units for delivery in the remaining months of 1922. Jigs and patterns for the car are complete, Doughty said, so that the company is prepared to get into immediate production.

Men identified with the Doughty organization are G. R. Tremelada, designer of the twin-three engine; C. H. Bennett, president and general manager of the Daisy Air Rifle Co., August Gieseler, superintendent National Tool Co., Cleveland; John McArthur, coach and automobile body builder, Detroit; Frank Sanders, former Franklin distributor, Chicago; George Gagnier, Detroit, and Earl B. Newton, secretary-treasurer Mansfield Steel Corp. and treasurer King Trailer Co., Detroit. L. M. Bradley has been named advertising manager.

A factory site will be selected in Detroit within a short time, Doughty said. Three models of the cars will be built at the start, touring, coupe and sedan. The list price on the touring has been fixed tentatively at $1280, and the prices on the enclosed models will be fixed later. Seventy-six dealerships have been assigned, Doughty said.

PHILADELPHIA ACCESSORY SHOW

Philadelphia, May 27—It was suggested at the May meeting of the Automobile Accessories Business Assn., that a committee be appointed to investigate the desirability of holding a separate automotive equipment show this year. On a previous occasion several members had conferred with one another on the possibility of taking the accessories and tire exhibits out of the annual show of the Philadelphia Automobile Trade Assn. and it now looks as if some definite action in this regard soon will be taken.

GOODRICH OUTPUT 16,000 A DAY

Akron, O., May 27—The B. F. Goodrich Co. has restored its factory to the eight hour shift basis, after operating ten hour shifts, and has increased production over 25 per cent. This increase brings Goodrich tire production up to approximately 16,000 tires a day. The company is said to be working on several new types of tires to be offered in competition with new cord lines introduced by Goodyear and selling at considerably under the standard cord tire market lists. Goodrich officials, however, say no announcement of new tires will be forthcoming for some time.

Cleveland Factories and Dealers Equally Prosperous

Production at High Point and Retail Sales Excel Expectations—Farmers Buying

CLEVELAND, May 27—Notwithstanding April was the best month since the boom days of 1920, May in Cleveland will be even better, according to statements of representative retailers and makers of automobiles.

The Studebaker agency here sold more cars last month than in any previous month of its history, and May is going to outdo that record. Otto C. Tyner, of the Jordan-Ohio, is putting over more business than Jordan ever before did in this city. Ninety-three cars were sold in April, and in May the number will go to 120 or 125.

At the middle of May there were 41 cars on the books for Jordan Play Boys. The demand has driven this agency to such an extent that there have been three cancellations of orders that were on the books for 45 days.

The Simmons Co., distributors of the Chandler, reports that May will eclipse all months of the present year, and that it will be the best since 1920.

Dodge, Buick, Ford, Reo, Franklin, Maxwell, Chalmers, and Hudson agencies report they have been surprised at the demand. Several said they never dreamed people would buy cars at the rate they are this week.

S. A. Grimm, of Perry county, which is one of the southern Ohio counties, was seen in the Studebaker agency last week. He stated that he was selling more Studebakers in his county than he could get. Farmers in that county are going into the market, and Grimm said the same is true in nearby counties.

In the manufacturing end, the Cleveland Automobile Corp. has shipped 4000 cars this year. This exceeds the total shipments for 1921. This company's finances are in good shape, earnings are satisfactory and by the third quarter a new record is expected in production.

Parts and accessory manufacturers here are sharing in the prosperity which has come to the industry. Standard Parts is going strong.

The Standard Welding Co., the Rim and Tube Division of the Standard Parts, reports 36 new customers on its books and an expected increase in shipments for May of 100 per cent over March. The increase in business is not entirely automotive, although there is a strengthening demand for the company's exhaust and windshield tubing and rims. One order for several million feet of tubing came from the general industrial field.

The Eaton Axle Co., axle division of Standard Parts, has just received some very substantial orders from Cadillac. Shipments to Cadillac, beginning next month, are scheduled at a rate greatly in excess of previous orders from this company.

Production for C. H. Wills & Co. has been very materially increased also, in line with the growing popularity of the Wills Sainte Claire car.

The Perfection Springs Co., another division of Standard Parts, reports that its tonnage shipments for May will be the highest of any like period in the last 13 months. Recent releases to truck customers indicate renewed activity in the commercial car field, while orders from passenger car manufacturers show a very marked increase.

April was the best month since Aug., 1920, for the Bock Bearing Co., of Toledo. May will be twice as big as April for the company. The roll department is running overtime. A double shift is working in the head grinding department and in certain other departments three shifts are working eight hours each.

The Torbensen Axle Co., has received an order from the International Harvester Co., which, with other orders, will keep its present force of 300 men busy for the rest of the year.

Enclosed Cars More Than Half of Two Makers' Output

Detroit, May 27—Hudson Motor Car Co. reports enclosed car business since Jan. 1 to be 55 per cent of the entire output as compared to a total of 31 per cent in 1921. Essex Motors business is reported to be running at slightly more than 50 per cent enclosed car, as against 19 per cent in 1921.

Both companies declare that the proportion of this business is continuing at approximately the same rate, even with warm weather at hand. Production totals for May when compiled are expected to show that the enclosed car percentage for that month is higher than the yearly average to date. Heavier proportion of enclosed car business is expected in the fall.

The new coach model and the ability of both companies through volume sales to offer it at a slight increase over open model prices are accepted by officials as the principal reasons for the rise in enclosed car demand. The demand for enclosed vehicles has slowed down the general production capabilities of the two plants somewhat, it is noted, owing to the greater time required to make enclosed bodies.

BUILDING FOR AUTOMOBILES

Philadelphia, May 27—Victor Rosewater, assistant to the president of the sesquicentennial celebration for Philadelphia in 1926, gave an interesting talk at a luncheon of the Philadelphia Automobile Trade Assn. He traced the history of the motor car in transportation at the world's fairs since 1900 and urged that there be a separate building at the Philadelphia exposition for automobiles.

Cleveland Dealers Adopt New Association Program

Undertake Broader Activities Under Leadership of Newly Elected Manager

CLEVELAND, May 27—Herbert Buckman, widely known in Ohio in the automobile industry, is the new manager of the Cleveland Automobile Manufacturers' and Dealers' Assn. He was chosen to carry on merchandising, service and other phases of concerted business action that the association is to undertake.

The association has in the past limited its activities, with few exceptions, to the management of the annual automobile show. But now that Buckman has taken hold of the job the organization will embark on an enlarged program for the benefit of the industry. Headquarters will be opened by the association and Buckman will be on the job the year round. He will be the manager of the 1923 automobile show, which will be held in the new $8,000,000 public auditorium.

G. G. Peekham, president of the Ohio-Buick Co., is president of the Manufacturers and Dealers Assn. He says that a central authority was needed for the handling of the ever increasing problems that arise in connection with the automobile business. It is the aim to establish an enlarged trade association as a separate and distinct organization in the automotive field.

The association includes representation from the 10 factories in the city and 35 distributors in the Cleveland field.

Buckman formerly was a newspaper man. Ten years ago he became associated with the Cleveland Automobile club, and he has been assistant secretary of that organization. During that period he was in charge of promotion and publicity for the annual show. He also was editor of the Ohio Motorist. He has severed his connection with the automobile club so that he may devote all of his time to the work of the trade association. He has been a consistent booster for good roads and has taken an active part in the affairs of the State Automobile Association.

TRAFFIC TRUCK APPROVES MERGER

St. Louis, May 30—Stockholders of the Traffic Motor Truck Corp. have ratified the plan calling for the transfer of all the assets of the company to the Associated Motor Industries, Inc., which, in turn, is to assume all the liabilities of the traffic corporation. Stock of the truck company will be exchanged for securities of the Associated Motor Industries.

CHEVROLET COUPE REDUCED

Detroit, May 27—The Chevrolet Motor Co. has announced a reduction in the price of its "490" coupe from $875 to $850.

Committee Named to Study Motor Vehicle Restrictions

Federal and State Highway Officials and Representatives of Automobile Industry on Body

WASHINGTON, May 27 — Discussion preliminary to a series of conferences between federal, state and automotive engineering officials today resulted in the appointment of a standing committee, to meet on call of the chairman, to study the whole question of motor vehicle restrictions.

The conferees discussed the necessity of developing roads from an economic standpoint and advantageous maintainance standards of weights, sizes, loads and weight distribution, advisability of seasonal restrictions, and, if advisable, by whom they should be made. Overloading and speeding also were taken up.

In regard to highway finance, the advantages and disadvantages of the present system were discussed. Advisability of laying down a uniform program as between states and the proper distribution of the cost of highways were gone into by the conferees, but action was deferred pending further discussion.

The following were named as a standing committee to consider the problems involved at a series of conferences, the first of which will last two days and will be subject to call of the chairman:

T. H. MacDonald, chief of the Bureau of Public Roads, chairman; C. H. Bennette of the Connecticut Highway Department, William O. Uhler of the Pennsylvania Highway Department, J. H. Mullen of the Minnesota Highway Department, N. J. Machall of the Maryland Highway Department, George P. Coleman of the Virginia Highway Department, W. C. Markham of the Kansas Highway Department, R. D. Chapin, W. T. White, A. J. Brosseau, George M. Graham, Alvan Macauley and Pyke Johnson.

"There is not very much that can be said of what we accomplished at today's meeting," Chapin said, "but the big thing is that for the first time in the history of the automotive industry representatives of that industry have met with federal and state officials to discuss common problems, and today's meeting is but the first of a series of conferences out of which a great deal is expected to come."

Campaign for Clean Overalls for Repairmen

Akron, Ohio, May 27—The Akron Automobile Service Assn., composed of 100 maintenance and garage men, headed by E. L. Deming, has started a campaign for uniform prices on repair work and parts in Akron, and to encourage all repair men to use care in working on enclosed cars. Every member of the association has pledged to wear a clean suit of jumpers when working on a sedan, coupe or limousine, so as to avoid soiling the upholstering, and to carry a handful of waste to use in preventing grease smudges on the body of the car and steering wheel.

ACCESSORY SALES INCREASE

New York, May 30—Another sharp increase in sales by members of the Motor and Accessory Manufacturers' Assn. was recorded in April. The total was $33,830,000, as compared with $28,670,000 in March, $22,720,000 in February and $17,330,000 in January. The increase for April over March was about 18 per cent. The total of past due accounts showed an increase of about 2 per cent in April, bringing the total to approximately $3,000,000. There was a decline of 1½ per cent in the total of notes outstanding, bringing the figure to about $2,500,000.

DURANT'S FIRST ANNIVERSARY

Lansing, May 27.—The Lansing plant of Durant Motors celebrated its first anniversary May 23 by turning out 123 cars. A year ago the site which the plant now occupies was an apple orchard.

How Freight Reduction Aids Automobile Business

Means Average Saving of $5 to the Purchaser on Each Car or Truck Shipped

NEW YORK, May 30—The horizontal reduction in freight rates ordered by the Interstate Commerce Commission, averaging 10 per cent, will result in material savings not only to the automotive industry but to purchasers of motor vehicles. It has been estimated that the freight bill for a normal year on shipments of finished passenger cars and trucks approximates $100,000,000. A 10 per cent reduction will mean a saving of about $10,000,000, or an average of about $5 on an annual production of 2,000,000 vehicles.

No statistics have been compiled showing how much freight is paid in a year by the various branches of the automotive industry on the shipment of supplies and raw materials, but it is believed it would amount to another $100,000,000.

The reduction will make a saving of from $15 to $30 a car, according to weight, on shipments from Detroit to the Pacific coast and of from $5 to $10 a car on shipments from the Detroit territory to New York.

Inasmuch as purchasers of cars and trucks now have the freight from the factory added to the price of the vehicle, they will profit directly by the reduction in rates.

BILL FOR COMPULSORY INSURANCE

Boston, May 25—All motor dealers and owners of cars and trucks would have to take out some sort of liability insurance in the form of a bond, or put up a cash deposit with the Massachusetts Motor Vehicle Registrar before they could get their cars registered next fall if a bill just presented to the legislature in its closing days goes through. It calls for indemnity bonds of from $5,000 to $10,000 for dealers and up to $5,000 for individual owners.

Second Annual Banquet of Michigan Automotive Trade Association, May 9

BUSINESS NOTES

J. V. Hainline, Minier, Ill., has opened a battery maintenance station at Clinton, Ill., and will make a specialty of electrical and battery work for motor vehicles.

W. C. Vollrath, Clinton, Ill., has been appointed Buick distributor in the DeWitt county territory, that car not being represented in that district for some time. He has opened a garage and sales agency and has organized the Vollrath-Buick Co.

Kentucky-Duesenberg Motor Car Co., a newcomer on Louisville Motor Row, has opened an office and salesroom. Officers of the concern are Eugene Cowles of Shelbyville and H. W. O'Donnell.

Fyrac Mfg. Co., Rockford, Ill., manufacturers of Fyrac Spark Plugs, reports a 102 per cent increase in sales for April, 1922, over April, 1921.

Kelly-Springfield Tire Co., of New York, has executed a lease of the first and second stories of the large building at Milwaukee, for warehouse and general headquarters purposes.

H. B. Fister and R. H. Boyd have opened a new garage at Arthur, Ill. The latter was in the same business at Decatur, Ill., for a number of years.

G. W. Arundel, J. W. Houston, and W. E. McNamara, Jacksonville, Ill., have formed a company and opened a factory for the manufacture of a type of tire chain for motor vehicles, which has a hook for quick attachment.

Hazlett Battery Co., of which C. W. Hazelett is president, has leased 15,000 square feet in a building in order to take care of growing business. In the new building, the production of the company will be doubled. The company manufactures storage batteries for automobiles and for radio plants.

Henderson & Davis, Decatur, Ill., have opened a new garage to be known as the H. & D. The firm will cater to storage and repair business and will also carry a complete line of accessories.

Barker Motor Car Co., Danville, Ill., has been organized with capital stock of $100,000, and will open a garage and sales agency. The promoters are A. F. Barker, E. L. Bolt, and H. A. Noble.

F. C. Roettgen, Streator, Ill., distributor of the Franklin car, has purchased the garage of Charles Purcell and will operate the plant in addition to representing the Franklin. Purcell, who has been distributor of the Chandler and Cleveland cars, will retain these agencies but plans another location for a salesroom. He will devote his entire time to these lines.

U. S. E. Corp., New York, has appointed the Buick Motor Co., New York City, territorial distributors for the U. S. E. bumper.

United Auto Service Corp. has been organized at Springfield, Ill., and a charter has been granted by the secretary of state. The company will deal in and furnish automobile service. The incorporators include E. P. Eustice, W. T. Lord, W. S. Wade, and P. E. Mullen.

Motor Truck Assn. of Philadelphia, will hold its annual summer outing, June 24, at Kuglers' Mohican Inn, on the Delaware.

Reo Motor Co. has opened a factory branch at Danville, Ill. S. E. Brandes of Chicago has been placed in charge as manager. The service station will be under the management of Arthur Hayes.

Marshall Motor Sales Co., of Springfield, Ill., has been appointed distributor for the Case line of tractors and other power farming machinery in the Sangamon county territory.

Comet Automobile Co. has increased its output to ten cars a day. Six models will be marketed and 4,500 bodies have been ordered to conform. President George W. Jaegers and J. W. McCarthy, assistant, are the active officers of the company.

Pontiac Valve Co., Pontiac, Ill., has been incorporated for $150,000 to manufacture automobile valves, accessories and engines. Incorporators are Charles P. Clarke, Frank S. Shaw and George Walton.

William F. Nutt, president of the Victor Products Co., has purchased the plant of the Excelsior Drill Co. Owing to the increase in the Victor Company's business, Nutt said it was necessary for them to obtain larger quarters.

Lomar Manufacturing Co., Middletown, Ohio, manufacturers of the Lomar Shock Absorber, has been incorporated in Ohio for $100,000, all common stock.

MacKenzie, White & Dunsmuir, Ltd., Vancouver, B. C., is the name of the new firm recently organized in Vancouver to do a straight accessory or automotive equipment and replacement business. So far as their plans are laid, they mean to cover the British Columbia field only.

Gillespie Motor Bus Co., Gillespie, Ill., has been incorporated for $10,000 to do a freight and passenger transportation business.

Fisher Motor Co., Orilla, Ont., is erecting a new factory to take care of its rapidly growing business. The company is putting on the market a radiator cap for automobiles.

Oakland Motor Co., Omaha branch, under the supervision of C. E. Burton, local manager, has remodeled an old building and made a new home here. This new remodeled building is one of the most complete automobile buildings in the city. There are more than 60,000 sq. ft. of floor space on the two floors and basement.

C. S. Woodworth Tire Co., distributors of Norwalk tires in Springfield, Mass., has opened a department for the sale of rims and rim parts, and has taken the agency for Amalite oils in three Western Massachusetts counties.

Myers & Hopkins Garage, Polo, Ill., has been sold to Volker & Panott, who will be the authorized Ford dealers in Polo and vicinity in the future.

General Auto Supply Co., Pascagoula, Miss., a new motor concern, has opened for business. The company will deal in automobiles, tires and accessories. The owners of the new business are A. J. Rice and J. B. Abraham.

Charles S. Burkhardt has been granted a permit to erect a seven story, 1000 car capacity garage at Buffalo.

C. H. Wills & Co. has taken over the building formerly occupied by the Illinois Tool Co., which adjoins the Wills plant in Marysville, and will operate it as a department of the Wills factory. A large number of men will be added to the factory force. May business will exceed April by a material margin, the company declares.

Biggam Trailer Co., Milwaukee, has decided to locate its permanent plant and offices in Racine, Wis., to take advantage of the facilities afforded by the numerous industries of that city to supply the important units making up the Biggam trailer assembly.

Viking Engineering Co., of West Allis, suburb of Milwaukee, has been incorporated for $75,000 by a group of engineers to engage in the manufacture of a line of mechanical devices, principally a patented automatic device for opening and closing garage doors from a distance by means of push buttons located at convenient places.

Cleveland Radiator Co., Cleveland, has been organized to succeed the Cleveland radiator division of the Sparks-Withington Co. H. K. Hall, formerly general manager of the Sparks-Withington property, will be president and treasurer. E. S. Weidle, vice-president and salesmanager, formerly was the Cleveland branch manager of the McCord Mfg. Co. of Detroit.

Motor Car Supply Co. of Canada, Ltd., and the Chapin Co., Ltd., have been amalgamated under the name of the former company. L. A. Cavanaugh, who has been the head of the original Motor Car Supply Co., will be managing director of the new organization. The company is a jobber of automotive equipment with a "wholesale only" policy.

Tennant Brothers, automobile bankers, have opened a branch in Columbus, Ohio. William Verross, who has been associated with the organization for many years, has been appointed general manager.

White Transportation Co., Frankfort Heights, Ill., has been incorporated for $10,000 by L. H. Martin, N. D. Martin and G. W. Martin to operate motor vehicles for transportation.

Stewart-Warner Speedometer Corp. announces that on Sept. 1, next, it will redeem its outstanding five-year convertible eight per cent gold notes due Mar. 1, 1926. There is outstanding a total of $1,850,000 of the original issue of $2,000,000. The notes will be retired at 104 and interest, under the redemption privilege.

R. M. Cowhan has been appointed export salesmanager of Earl Motors, Inc., succeeding Clarence Thurston, who died some time ago. Cowhan was formerly an assistant salesmanager at the factory and will continue the export headquarters there.

Court Garage, Inc., Pekin, Ill., has been incorporated for $7,500 by Arthur E. Severe, Glenn W. Fluegel and Henry Stockert to deal in farm machinery, trucks and tractors.

Dependable Truck Service Co., Springfield, Ill., has been incorporated for $15,000 by L. C. Dodgson, Carl Brendel and F. A. Muench, to conduct a transportation business.

Yellow Bus Line Co., Christopher, Ill., has been incorporated for $15,000 by Bart Vollesio, Hub Leone, and Angelo Mantinio to conduct a transportation business.

Record Truck Business Expected by Distributors

General Motors Branch Managers From Eight Cities Tell of Increased Orders

PONTIAC, Mich., May 30—Better truck business, in fact record truck business, is foreseen by 45 salesmen and branch and agency managers of the General Motors Truck Co., who were here May 22 and 23 at the second assembly of a series of six being held by the company in the local plant. The men came from Atlanta, Ga., Cleveland, Buffalo, Minneapolis, Duluth, Charlotte, N. C., Omaha, and Lincoln, Neb.

Although from widely separated territories where business is of a diverse nature, their expressions with regard to the future of the business were almost identical. Orders are coming in strongly, they said, and they all find that the bulk of business is on the lighter models, with the one-ton truck getting the biggest call. In fact, this model, it was brought out, constitutes about 60 per cent of the orders received.

The men assembled in Detroit Monday, where they were taken through the General Motors engine plant, and came to Pontiac on Monday afternoon for inspection of the local plant, with its new machine shop in use and its new testhouse just under construction. They were guests of W. L. Day, general manager, at a dinner party at the Bloomfield Hills Country Club in the evening and had a business session for discussion of sales problems. Tuesday was devoted to discussions, and a survey of the field of truck sales.

"The best year in the history of General Motors Trucks was predicted by practically all of the men who attended," according to the sales department, following the session. To bear out this opinion, the plant is now running on a basis of 7,500 trucks annually, of which the majority are of the one ton model. In addition to the effect of the new models announced for this year's trade, the price reduction recently made has been having a stimulating effect on business, in the opinion of the salesmen.

The third of the series of meetings will be held here on June 5 and 6, with the representatives coming from the New York, Boston and Kansas City districts. Many eastern cities will be represented, with at least 30 men expected to attend.

Franklin Automobile Co., Syracuse, N. Y., has been hiring new employes at the rate of about 150 a week and gradually increasing its production to 50 cars a day.

Henry Auto Parts Co., Milwaukee, is a new corporation with $50,000 capital stock which has been organized by the principal officers and owners of the Prime Mfg. Co., Milwaukee, manufacturing brass castings and specialties.

Columbus, Ohio, branch of the Goodyear Tire & Rubber Co., has been moved to larger quarters.

C. L. Coutellier and **H. A. Fullen**, both formerly connected with the Columbia branch of the Goodyear Tire & Rubber Co., have opened a battery station and tire business under the name of the C. & F. Auto Supply.

CONCERNING MEN YOU KNOW

J. E. Garlent has been appointed Works manager of the Auto Wheel and Gier pressed Steel plants of the Motor Wheel Corp., of Lansing, Mich.

Kenneth Gardner, who has been with the New England Oakland Agency and the Dunbar Co., of Boston, has become interested in the George S. Jacobs Co., Franklin agents here, and is in charge of sales.

F. S. Stratton has resigned as general salesmanager of the Grant Motor Car Co. He has accepted a similar position with the Vacuumeter Mfg. Co., Cleveland.

C. B. Phelps, Jr., has been appointed assistant to the managing director of Dodge Bros. (Britain) Ltd., which was organized recently to handle Dodge Bros. business in the British Isles. Phelps has been with Dodge since 1916, in both foreign and domestic merchandising work.

W. P. Loudon, formerly of Pittsburg, has been made resident engineer of the automotive equipment department of the Springfield (Mass.) plant of Westinghouse Electric Mfg. Co.

Walter C. Darling has been appointed assistant manager of the Leonard-Pollock Co., distributors of Stevens-Duryea and Hupmobile cars in Springfield, Mass., and vicinity.

Cyrus McCormick, works manager of the motor truck division of the International Harvester Co., visited the Springfield, O., works a few days ago and conferred with Superintendent C. H. Smart regarding production.

J. N. Levick, formerly of the advertising department of Sears, Roebuck & Co., has joined The Better Tires Co., Chicago, mail order jobbers of tires and accessories.

S. A. McGonigal has been elected president and managing director of the Cleveland Tractor Co. of Canada, Ltd., succeeding J. L. Hibbard, resigned.

J. H. O'Meara, after spending eight years in retail automobile merchandising, has joined the sales department of the McCaffrey Motor Co., Omaha.

Harmon D. Palmer, chief engineer of the Kissel Motor Car Co., Hartford, Wis., has been granted patents on a new design of cast steel spring hanger to overcome rattling and other noises. The patent has been assigned to the Kissel company, which is equipping its cars with the new device as stock equipment.

Monroe Kleinsteuber, formerly superintendent of the fire and police telegraph alarm and signal system of the Milwaukee Fire and Police Commission, has joined the Jessen Automatic Equipment Co., Milwaukee, as manager of the sales promotion department and associate engineer.

Harry Z. Rosenfeld, representing the Automotive Manufacturers' Assn. of Omaha; **J. M. Hussey** of the Omaha Auto & Radiator Manufacturing Co.; **Charles Weir** and **G. W. Brinkworth,** of the United States Rubber Co., represented the automotive industry of Omaha on a trade trip recently undertaken by Omaha business men through the South and the Southwest.

L. Neal Blacker, vice-president of the Huntington National Bank, Columbus, Ohio, has been selected president of the Standard Motor Car Co., filling the vacancy caused by the death of Harry J. Schwartz. The Standard Motor Car Co. is central Ohio distributor for the Hudson and Essex.

Stewart Scrimshaw, manager of industrial relations of the Kearney & Trecker Corp., Milwaukee, manufacturing of milling machines and other machine tools, has accepted a position on the faculty of the college of engineering of Marquette University, Milwaukee.

Marvin E. Monk has been named assistant salesmanager in charge of general sales of the U. S. Ball Bearing Mfg. Co. J. J. Torpey will continue as assistant salesmanager in charge of bearing distributors.

R. M. Dearing has been appointed as successor to **H. C. Whipple,** branch manager of the Bearings Service Co.'s Denver office.

Leon L. Kinstler has been appointed salesmanager of the Van Wheel Corp., Syracuse.

L. J. Belnap, president of Rolls-Royce of America, Inc., has been appointed aeronautical commissioner for the city of Springfield, Mass.

Loren T. Robinson, assistant advertising manager of General Motors Truck Co., has gone to the Campbell-Ewald Advertising Agency in Detroit.

Rickenbacker - Philadelphia Co. has taken on the Rickenbacker Six. C. H. Stoer and W. Fred Stoer are respectively president and secretary-treasurer of the company and Robert R. Ramey is vice-president and general manager. The building is a combined sales and maintenance structure.

R. M. Dearing has been appointed Denver branch manager of the Bearings Service Co., succeeding H. C. Whipple, who has resigned. Previous to the Denver appointment Dearing was assistant branch manager of the Chicago headquarters.

Fred H. Caley, Cleveland, has been elected president of the Ohio State Automobile Assn. He has been secretary of the organization, working for its interests simultaneously with those of the Cleveland Automobile Club and the Cleveland Automobile Dealers' Assn. of which he has been secretary.

W. M. Smith, general manager of the Spencer-Smith Machine Co., of Howell, Mich., announces the appointment of **J. E. Neals,** formerly of Chicago, as salesmanager. Neale is now arranging for nation-wide distribution of Spencer-Smith Pistons.

L. H. Bloom, assistant salesmanager of the Hart-Parr Co., Charles City, Iowa, has been appointed general salesmanager to fill the vacancy left by the resignation of W. S. Fredrickson. Bloom has been with the Hart-Parr company for the past six years and previous to that had several years' experience in the tractor business.

Alfred Reeke, president of the Reeke-Nash Co., and the Reeke-Lafayette Co., Milwaukee, has been appointed a member of a committe of fifteen prominent business men representing various lines to make plans for a great Made-In-Milwaukee Industrial Exposition to be given in the Auditorium next October, under auspices of the Milwaukee Association of Commerce. Nothing of this kind has been attempted since the fall of 1913.

J. L. Hensell has been appointed manager of the wholesale department of the Girard Automobile Co., distributors of Peerless cars in the Philadelphia territory.

J. C. Lawrence, Akron, O., has been elected president and general manager of the Racine Horseshoe Tire Co., Racine, Wis., which is the reorganization of the Racine Auto Tire Co., manufacturing Horseshoe tires, passing through the bankruptcy court. Lawrence was for many years associated with the Firestone Tire & Rubber Co. and was vice-president of the Rotary Club of Akron.

A. D. Paine, widely known as a tractor salesman, has become president and general manager of the Wisconsin Tractor Sales Co. of Oshkosh, Wis. This company has taken the distributor's contract for the Hart-Parr tractors.

MOTOR TRUCK GROCERY STORES

Columbus, May 29—Ten Acme motor trucks are being fitted up as traveling groceries soon to be operated on the streets of Columbus to supply groceries at cost to the housewife. They are being fitted up with white enamel bodies and are equipped with refrigerators. The company which will operate the trucks is known as the Modern System Grocery Co., chartered under Ohio laws. J. W. Baker, manager of the factory branch of the Acme Motor Truck Co., is president and Joseph Devaney, vice-president of Carson, Pirie & Scott Co., commission merchants is vice-president.

FORD TRACTOR SHOW

Louisville, Ky., May 27—All types of Ford automobiles and tractors, and the Lincoln motor car, were exhibited in a parade which marked the opening of the Industrial Tractor Show of the Ford Motor Co. About 50 Ford dealers from Kentucky and Tennessee attended.

Automobile Advertising Men To Discuss Selling Problems

Meeting of Managers at Chicago June 13 Will Consider a Number of Timely Topics

NEW YORK, May 29—A tentative program has been prepared for the meeting of advertising managers representing members of the National Automobile Chamber of Commerce which will be held at the University Club in Chicago, June 13. Edward L. Jordan, chairman of the advertising committee, will preside. Among the topics which will be taken up will be:

"Relationship of the advertising department to the dealer," with the discussion led by A. B. Batterson of the Buick Motor Co.

"Special problems in motor truck advertising," with the discussion led by L. B. Dudley of the Federal Motor Truck Co.

"The next big selling punch," with the discussion led by Jordan.

"Selling cars to women," with the discussion led by Elizabeth Hallam Bohn.

"Advertising used cars," with the discussion led by C. U. Radoye of the Haynes Automobile Co.

"How the advertising manager can help the industry."

"What automotive happenings are news," with the discussion led by W. A. Bermingham of the Chicago Evening Post.

"The place of pictures in advertising," with the discussion led by W. K. Towers of the Paige-Detroit Motor Car Co.

175 KNIGHT ENGINES DAILY

Pontiac, Mich., May 29—A schedule of 175 Knight engines daily has been received by the Wilson Foundry and Machine Co. here and every effort is being made to reach that point in the new Knight department of the Wilson plant, installed during the past winter. The production, which has been increased steadily from 25 daily during March, has now passed the 100 mark, and overtime and holiday work are being done to speed up to the required figure.

The schedule given for June production is 25 more than the largest estimate of production given out when the plant was moved here from Elyria last December.

CZECHO-SLOVAKIAN HILL CLIMB

Prague, May 2.—(By Mail.)—The sixth international hill climb under the auspices of the Automobile Club of Czecho-Slovakia was held from Zbraslav to Jiloviste, near Prague, on April 30. The distance was 3.02 miles with an average grade of 3.5 per cent and the steepest spot 9 per cent. There were 51 starters in the various classes. The best time was made by a Mercedes car driven by Salzer, who made the distance in 3 min. 30.95 sec. A new motorcycle record of 3 min. 51 sec. was made by Chlad with an Indian.

IN THE RETAIL FIELD

Homer Wright, attached to the Columbus, Ohio, branch of the Kelly-Springfield Tire Co., was the winner of a prize of $100 in gold offered by the sales department covering sales of Ford sizes in April.

Van Dorn Sales Co., Columbus, Ohio, distributor for the Grant and Columbia Six, has moved into new quarters and has taken on the distribution of the Lexington in central Ohio. The Lexington-Columbus Motor Co. has been merged with the above named concern.

Herbert Bros., Philadelphia, Chandler distributors in the Philadelphia territory, and the Cleveland-Herbert Co., Cleveland distributors, have consolidated on local sales, united their salesforces and placed cars on the sale. A. A. Cauldwell has been appointed joint salesmanager.

Automotive Regrinding & Welding Co., Appleton, Wis., has been formed by William Storm, Martin Van Ryzin and Clarence Tibbits, heretofore operating as the Service Garage. A new machine shop building has been purchased and will be occupied after June 10.

Fred Pope, Fond du Lac, Wis., tire dealer and repairman, has purchased the Korrer building and is rebuilding it into a modern tire store, maintenance department and warehouse. He will add a complete line of automotive equipment and sell fuel, lubricants, etc.

Kirnberger Bros., Ashland, Wis., have purchased the Ashland Battery Co. from Fred Gould. The new owners have been appointed Willard dealers and maintenance station.

United Consumers Corp., Milwaukee, has been incorporated with a capital stock of $500,000 to buy, sell, erect and operate gasoline filling stations and automotive equipment stores. The incorporators are Homer K. Ross, Joseph E. Tierney and G. F. Zucker, all of Milwaukee. The corporation succeeds to a business founded about two years ago, which has established branches in many Wisconsin cities.

Black River Nash Co., Black River Falls, Wis., has been incorporated for $10,000 to deal in new and used cars, conduct garage and repairshop, deal in automotive equipment, etc. It has a Nash franchise. J. F. Van Etta, August Berg and Emma Berg are the incorporators.

Buick Garage, Kenosha, Wis., owned by Emil B. Moericke, is building a $20,000 addition to provide more office, storage, display and maintenance shop room.

Appleton (Wis.) Auto Radiator & Sheet Metal Works, since Aug. 1 occupying the second floor of a building, has taken over the main floor for expansion of the business.

Glenn W. Gray, salesmanager for the Doan Motor Co. in Toledo, reports that his company is 21 cars short of orders filled. Of this number, 68 are for Toledo. The company distributes Studebakers in this part of the state.

Dort Sales Co., Omaha branch, will become distributors of the Haynes cars in this territory. The first shipment of Haynes cars arrived here on May 15 and since that time one car a day has been sold, according to the manager.

H. E. Dennis, Toledo distributor for Apperson and Grant lines, has recently acquired the agency for the Rauch & Lang electric. He is a former agent for Detroit Electrics and has a maintenance department equipped to handle the new line.

Charles C. Hale, of Turlock, Cal., has been appointed Overland and Willys-Knight distributor at Modesto, Cal.

Auto Electric Co., Milwaukee, one of the largest exclusive maintenance stations for automotive electrical equipment service, moved May 22 to new and more commodious quarters. A complete battery shop will be an added feature of the new plant.

"Wonderful Change" in Tractor Sales, One Company Reports

Chicago, May 27—The farming sections of the middle west are beginning to buy tractors in considerable numbers, according to reports received here. In a letter to MOTOR AGE the Hart-Parr Co. of Charles City, Iowa, states that a wonderful change in tractor sales has taken place in the last 30 days.

"Farmers who swore they would not buy are changing their minds over night," the letter says. "Tractors are moving from dealers' floors into the hands of farmer owners rapidly in every part of the country.

"Reports from the field show an evenness in demand that is very encouraging. These reports cover territories in Pennsylvania, Indiana, Wisconsin, North Dakota, Kansas and Louisiana. Practically every report tells of sales to farmers and list new prospects for fall."

APPLYING RADIO TO SERVICE

Boston, May 29.—"The Application of the Radio Receiving Set to the Service Automobile" was one of the principal addresses at the meeting of the New England Division of the National Electric Light Assn., bringing together for the first time in some years all the electric vehicle distributors and men of allied interests. It was held at the Boston City Club, with Charles E. Edgar presiding and Edward S. Mansfield toastmaster.

H. J. Tyzer, of the American Radio and Research Corp., made the address, and he showed how it was possible for the man in charge of a service station to receive quick calls, and even while the service vehicle was out on the job to give directions before returning as to whether another job was necessary. M. M. Vinzant, superintendent of the motor vehicle repair shop of the American Railway Express Co., gave a very interesting talk on "The Electric Truck in Express Service," which gave data on upkeep and other costs.

NEW TIMES SQUARE COMPANY

New York, May 29.—The Times Square Auto Supply Co. has been incorporated in Delaware, with a capital of $3,400,000, to acquire the assets of the Consolidated Distributors, Inc., which has been in receivership since September last. The incorporation is in accordance with the reorganization plan which has been accepted by creditors. The Consolidated Distributors, Inc., was incorporated in this state in September, 1916, as the Times Square Auto Supply Co. and operated under that name until March, 1921.

MACK RAIL CAR TRIED OUT

Chicago, May 29.—The new Mack rail car, a Mack motor truck equipped with special passenger body and baggage compartment, recently made a trip between Paris, Ill., and Chicago.

This car will make several runs between Chicago and Joliet in the near future. It is estimated that the cost of operation will be but one-third the cost of the steam locomotive, and cars to carry the same number of passengers.

The average speed attained is from 35 to 40 miles an hour. It is the same car that was tried out with success in the east.

Automobile Trade Shows Improvement in Northwest

Some Minneapolis Dealers Unable to Get Enough Cars to Fill Orders

MINNEAPOLIS, May 29—Financial conditions generally in the northwest are improving and these conditions are being reflected in the automobile trade, to such an extent that many dealers cannot get all the cars they can deliver. In the cities the higher priced cars sell well, and in the country there is a good demand for the lower priced cars. This latter point is emphasized in the report that in the Minneapolis district Ford sales for April were 4,866 cars and trucks and 433 Fordsons. The three larger cities, St. Paul, Duluth and Minneapolis, report 1,836 cars delivered for the month. These are the largest totals for April that the branch can show. In the local plant 513 men are now employed and they are assembling 240 cars a day.

J. H. W. Mackie, general manager for the Payne Motor Co. told the Cooperative Club that the business in the city in 30 days has been nothing short of phenomenal, and that firms handling standard makes have not the cars to deliver. The company sales are the best since the spring of 1920.

The Northwestern Automobile Co. reports a good business in Jordans with not enough cars to make deliveries. The country business in this line is not so noticeable yet. The Harrington Motor Co. reports that up to date it has sold as many cars as in 1921, and that was its largest year by 25 per cent of any in the last five. The Gray Motor Co. said the company is two to three weeks behind orders on deliveries, because with the market down as to price and the values assured the public is stepping in and buying cars. The Pence Automobile Co. doesn't expect to get caught up on deliveries this season, and many dealers were not prepared for the unexpected business that has appeared.

TO REORGANIZE AT COLUMBUS

Columbus, O., May 29.—The Columbus Automotive Trade Assn. will soon be called together for the purpose of reorganizing the association, following the formation of the Columbus Automobile Dealers' Assn. Jobbers, tire dealers and repairers, garage proprietors and repairmen will constitute the bulk of the membership. It will continue to be affiliated with the Ohio Automotive Trade Assn.

A SUMMER SHOW

Chicago, May 29.—The Chicago Automobile Trade Assn. will have charge of the automobile exhibit at the second annual Pageant of Progress to be given on the Municipal Pier here, beginning July 29. About 40 dealers and distributors already have taken space.

The Readers' Clearing House

Questions & Answers on Dealers' Problems

Advice on Doing Brake Relining as an Exclusive Business

Q—Will you please advise me if you think it would be a good business proposition to open an exclusive brake lining establishment in a town of 100,000 population. As you know good brakes are one of the most essential parts of an automobile and often one of the most neglected, and I am considering entering this branch of automotive maintenance.—Charles Lamar, B. V. Garage, Hearne, Tex.

Answering your inquiry regarding whether it would be a good business proposition to open an exclusive brake lining establishment in a town of 100,000 people, we would say that the MOTOR AGE staff does not believe that it is a very business like proposition, generally, to put all of your eggs in one basket.

We believe that a town of 100,000 could easily support an establishment that would specialize in brake lining work, if this establishment would advertise freely that good material is used and would advertise flat rates for brake lining operations on all cars. We believe that to properly work up a business of this sort, the advertising would be a very important feature of it.

But, we think that the man who opens such an establishment would be making a mistake and overlooking opportunities if he did not sell other materials. We believe, also, that such an establishment would do well to take on some other work, such as greasing cars, etc.

Certainly you would be overlooking a splendid opportunity if you did not put in a merchandising department where at least some accessories and standard car equipment could be sold.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

In addressing this department, readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

Lighting On Buick D-45

Q—We are having trouble with a Buick D 45 model 1920. When standing still the lights are good. When running 25 miles an hour the lights are somewhat brighter but when the throttle is closed and the engine runs very slowly the lights are very poor until the speed of 25 m. p. h. is again reached. When standing still with the engine not running the lights are all right and they do not dim very much when the starter is used. Battery shows 1260. Advise what may be the nature of this trouble.—Pounds Repair Co., Centralia, Ill.

According to our records the model D-45 was made in 1916 but as the general scheme of wiring is the same it does not affect your problem. The trouble being experienced is doubtless due to a poor connection combined with the fact that operating the ignition switch not only supplies current to the ignition but also makes a connection from the battery through the ammeter to the armature and field of the generator.

When the generator is running at high speed this connection permits charging current to go to the battery but if the engine should be run at very low speed so as to draw some current from the battery it would tend to have some dimming effect on the light, although, of course, it should never be as much as when operating the starter.

We suspect that the trouble is due to a poor connection either in the wire which goes from the heavy terminal on the motor generator up to the ammeter, this being about a number 10 wire or else the trouble is due to a poor connection in the ammeter or a poor connection from the ammeter to the number three terminal of the lighting and ignition switch and we would suggest your inspecting the terminals at the points above mentioned.

Locating trouble by inspection, however, is not always satisfactory and a much better way is to use a voltmeter of about zero to 15 scale. To make this test the engine should be run with the throttle closed so that it is turning over very slowly and so that the lights are dim as indicated in your letter. Then the voltage should be taken at the battery to see if it is approximately six volts. The voltage should then be taken from the frame of the car to the large terminal on the motor generator. Then from the frame of the car to the ammeter terminal which is connected to the large terminal on the motor generator then to the other ammeter terminal, then to the number 3 terminal on the switch.

With everything in good shape all of these voltages should be about the same but if there is a poor connection in the ammeter, for example, there will be considerable difference. Perhaps on one ammeter terminal a reading of six volts will be obtained and on the other ammeter terminal a reading of 5 volts. This would show very serious trouble in the ammeter. However, should the voltage at one ammeter terminal be 6 volts and at the other ammeter terminal 5.95 volts or perhaps 5.9 volts this would not show any abnormal condition, as there is a slight difference even with a good meter.

The trouble or poor connection will then be in between the place where the voltage was good and the following place where the voltage was considerably lower. It might also be well to inspect the contacts in the circuit breaker to see that they are clean and if there is any doubt as to their condition a thin file like a magneto file can be run between the contacts in order to clean them up. We believe that the trouble will be found in a poor connection, however, as previously indicated.

Responsibility for Part Lost in Shipping

Q—I have a model 45 Interstate car in which I stripped the first gear and, I had a garageman here send the countershaft and gears to a salvage company in Iowa to have the damaged gear duplicated. The people we sent the gears to claim to have lost the shaft and gears and and I cannot get an answer to my letters. What is right in such a case? Should they make this good. or am I asking more than is right in asking them to replace this outfit which they can get from the company that made it?—Barb's Mill, Downing, Mo.

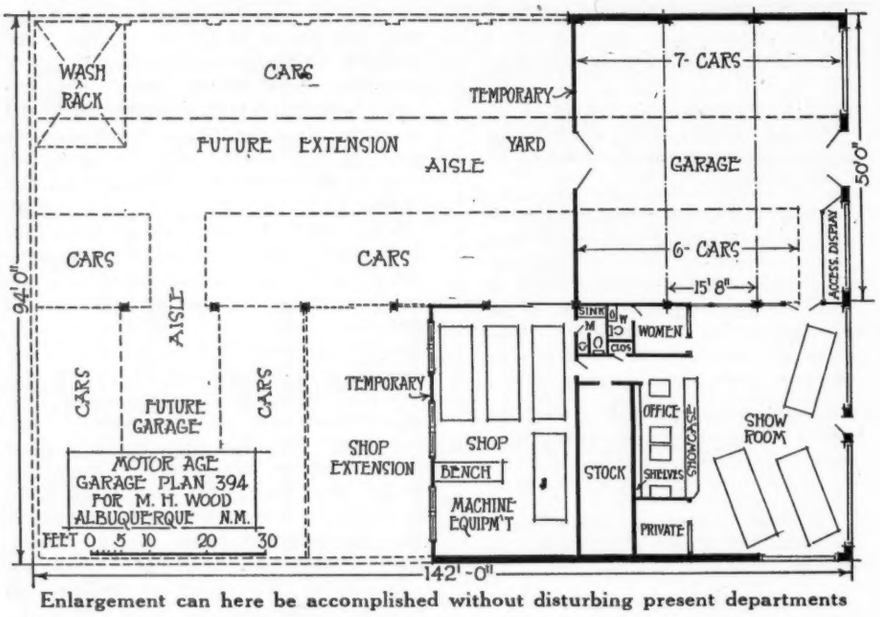
Certainly the salvage company should make good to you for their loss of your property. It is responsible for the safe keeping of your property consigned to them for the purposes of business, and should be made to understand the seriousness of their negligence or carelessness in handling its business affairs. It may be that the local garageman is primarily liable to you in the matter; and if he was acting for himself, and not simply as your agent in sending the parts away, he is responsible to you.

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making a request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.
What departments are to be operated and how large it is expected they will be.
Number of cars on the sales floor.
Number of cars it is expected to garage.
Number of men employed in repair shop.
And how much of an accessory department is anticipated.



Enlargement can here be accomplished without disturbing present departments

Building With View to Expanding Later

PLAN 394

Q—I have a piece of ground fronting on the main traveled street, 94 ft. front and 142 ft. long. As I cannot build on all of this ground at this time, I am figuring on building across the 94 ft. and putting in a permanent front and building back 50 to 60 ft. at this time and completing the building later. When the building is completed I expect to use 50 x 142 ft. for storage only with a washrack in the rear.

I enclose a sketch of my plan for building when it is completed and want the showroom, offices, etc., put in permanently now and the shop to be moved later. You can, no doubt, suggest a plan that will be better for completed building and one that will handle all except storage on this 94 x 60 ft. and that can be worked into a completed building.

I want plenty of room for at least 3 cars in showroom. Will handle accessories via the showcase and wallcase route and a stockroom for parts. Will have four mechanics in shop and will have necessary shop machinery.—M. H. Wood, Albuquerque, New Mexico.

Your layout is very good on the finished job but we think it can be improved to better suit the present needs and require less alterations for future use.

Our sketch averages 60 ft. deep but the garage side extends back only 48, while the office side is 72 ft. deep. This will avoid the moving of the shop which is rather expensive if there is shafting and machinery to rearrange. The shop will be in its final position and the garage will not have been interfered with.

In connection with moving the machinery, if individual motor driven machines are bought in the beginning they are very easily and quickly moved to suit any new arrangement that future needs may demand. These machines may cost slightly more in the beginning but are cheaper in the end.

We are of the opinion that eventually you will use all of the office side of the building east of the stockroom for shop purposes, confining storage to the 50 ft. section; a paint shop, for instance, should prove more profitable than storage unless storage rates are higher than in most cities the size of Albuquerque.

You should have a women's restroom unless you are way off from the tourist routes and even then one would do good.

Eventually you will need some skylights, in fact you will need some immediately. You should look to the future and place them as you go along. Light is important, especially so in the shop.

FORD BATTERY INSTALLATION QUESTION

Q—Is it possible at all times to tell when installing a battery in a strange car which of the battery terminals should be grounded?

1—One easy way to check the battery is to turn on the lights and watch the ammeter and if the battery is properly installed the ammeter needle will go over to the discharge side, while if the battery is put in wrong, that is, the wrong terminal being grounded, turning on the lights will make the ammeter go over to the charge side. Therefore if the ammeter reads properly the battery is correctly installed. Aside from the effect on the ammeter the reversing of the battery with most electrical systems does absolutely no harm if the cut-out on the generator or on the dash is closed once by hand to allow battery current to flow to the generator and magnetize it in the proper direction. This is a precaution therefore that it is well to take if the battery has been installed and the battery man is not absolutely sure that it has been put in properly. This would especially apply to a car which had no ammeter on the dashboard.

Timing Ford Engine

2—In rebuilding a Ford motor we found that the timing gears were not set according to the punch marks. It then occurred to us that in installing the timer brush or roller that it might be put on in the wrong position. Would this be possible?—Skandia Garage, Skandia, Mich.

2—It occurs to us that if the punch marks on the timing gears do no coincide you may possibly have the camshaft out of time which will make the valves open and close at the wrong time beside affecting the ignition. On a Ford engine the exhaust valve should close in number 1 cylinder just after the number one piston has reached top dead center and barely started on the down stroke being approximately 1/64 of an inch down from extreme top position. If the valves are operating properly there is but one way to put the timer roller on with the latest construction. With timer rollers made a few years ago however it was possible to put them on either exactly right or in just the opposite position. With the old type camshaft the wrong location of the rotor could be corrected by changing the rotor 180 deg. or by moving the timer wires 180 deg.

UNUSUALLY HIGH LIFT BREAKS VALVES

Q—We have a Nash 6 race car which has an inch lift on the valves with a special racing camshaft. Dodge stock valves are used with the exception that the head of the exhaust is ground down to the size of a Nash stock head. These valves will not stand the strain, the heads break in pieces and the stems break in two. Neither will they stand the use of double (Dodge and Ford) valve springs which we believe very essential to a high speed engine of this type. What company makes special equipment for race cars?—C. A. Baker, Charleston, Ill.

We doubt whether you will ever secure a valve using stiff springs that will stand one inch lift at high speed. It is surprising to imagine any one building a camshaft using such a great amount of lift. If you wish to speed up your Nash car we would advise that you communicate with the factory as they are in a better position to advise you just what should be done to the car to give it added speed than most any one else.

Changing Cadillac Electric System

Q—Advise how to change a 1913 Cadillac electrical system so as to use the motor-generator as a generator only in connection with a six volt battery for supplying current to lights and ignition.

1—A diagram of the motor-generator is shown below at right, and it will be noticed that there are four terminals. In using the motor-generator as a generator only however, the number four terminal will not be used and the heavy connection to the starting switch will not be used. The number three terminal should be grounded that is connected to the frame of the engine which will ground one of the brushes and one end of the shunt field. The other end of the shunt field comes out at the number two terminal and should be connected to the number one terminal with a coil of iron wire.

The exact amount and size of iron wire will be a matter that you will have to determine by experiment as this is put in the shunt field circuit to prevent excessive charging current going to the battery and we would suggest that at the maximum speed that the customer drives the car that the charging rate should not exceed 18 amperes and a lower charging rate should be used if the car should be driven at this speed for three or four hours. If the charging rate is too high it will be necessary to use either a greater length of wire of else wire of smaller diameter. Any good six volt cutout can be used, the number one terminal of the motor-generator being connected to the "G" terminal of the cutout and it will be also necessary to connect the frame or base plate of the cut-out to the engine or ground. The other circuits should be self-evident from the figure.

Oiling System on Locomobile

2—Publish diagram and explain operation of oiling system on Locomobile cars.—Jos. Huwiler, San Francisco, Calif.

2—A diagram of the oiling system used on Locomobile cars since 1916 is shown below, which illustrates the use of a combined low pressure feed and splash system. The oil pump in the rear of the engine oil pan holds about six or seven quarts of oil. The oil feeds from the sump number one through strainer number two and connection number four to the gear oil pump number three. From the pump number three the oil feeds up pipe number five and some of it branches off at the connection number six to the long pipe which supplies oil to the troughs into which the connecting rods dip. Oil also goes up pipe number seven and across pipe number eight which feeds oil to the main bearings. Oil continuing through pipe number eight lubricates the magneto and pump shaft bearings. The connecting rods are lubricated by means of a small scoop on each one which dips into the oil trough ⅛ in., the splash from these scoops also oiling the pistons, wrist pins and camshaft bearings, also the valve tappets and rollers. Baffle plates are placed in the bottom of each cylinder to reduce the opening through which the oil reaches the cylinder walls, this being done to prevent excessive lubrication which would foul up the spark plugs and cause smoking. A large baffle plate also covers the oil sump and prevents flooding of the front end of the engine when going down hill.

Opinion and Law

Recently a query regarding the "Storing for Hire" law in Illinois was answered in the Clearing House. Some persons questioned this answer because, they said, the attorney general had announced a different attitude toward the law. The legal contributor gives this opinion as to the effect of the attorney general's announcement concerning this law. This definition of the effect of opinion as to a law holds good in many similar cases.

The attorney general of Illinois has issued a public statement to the effect that the Illinois statute entitled, "Storing Personal Property for Hire—An act to regulate business of storing personal property for hire," does not include garages and no bond or license is required of them under this law. The act reads: "After September 30, 1921, no person, firm or corporation shall engage in the business of storing personal property for hire without a license issued by the public utilities commission or by the state commission exercising the power of supervision over public utilites."

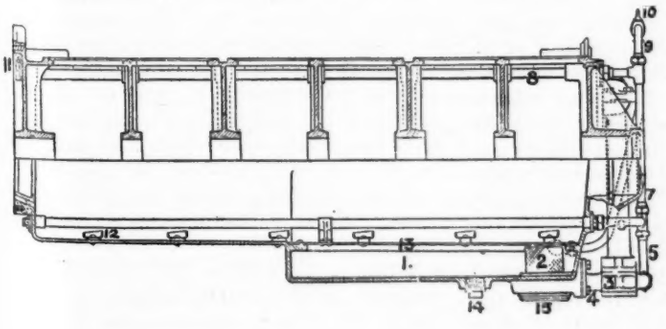
This language is broad enough to include garagekeepers. Other parts of the act refer to warehouses and thus tends to ambiguity. The statement of the attorney general may help to clear up the ambiguity, at least it will tend to prevent prosecutions possible under the act, by laying down a policy of action for the administration of the law. The penalty for failure to comply with the law is a maximum fine of $1000 and a prison sentence of six months.

Under the attorney general's announcement this penalty will not be enforced by prosecution of all garages, but even that is not all of the apparent difficulties possibly to be encountered in this act in its present state of uncertainty. Since no firm is permitted to engage in the business, etc,. then one is not sure that a delinquent customer cannot set up this non-compliance of the garageman to defeat all accrued charges against him for storage.

The attorney general's statement is his opinion of the law. Should a garagekeeper sue for his storage charges, his failure to comply with this law would be the first defense of the customer. Then the law would be put up to the court to determine whether the garagekeeper must comply with this act.

Naturally the court of last resort would be the one to ultimately determine the question. The intention of the legislature in adopting the act would control. Arriving at this intention from the use of the term warehouse in parts of the act the attorney general is of the opinion that the act does not and was not intended to apply to garages where automobiles are stored temporarily as over night, etc., and are intended to be taken out as suits the needs of the customer.

Therefore, the garagekeeper in Illinois need have no fear of trouble from the state and the attorney general's office, at this time at least.



1. Sump or Reservoir
2. Strainer
3. Pump
4. Pump Supply Pipe
5. Delivery Pipe
6. Supply Pipes to Troughs
7. Supply Pipe to Main Bearings and Overflow
8. Supply Pipe to Main Bearings
9. Oil Bypass
10. Bypass Valve
11. Oil Feed to Magneto and Pump Pinion Bearings
12. Troughs for Connecting Rod
13. Removable Baffle Plate
14. Drain Plug
15. Strainer Plug

Diagram of oiling system used on Locomobile cars since 1916.

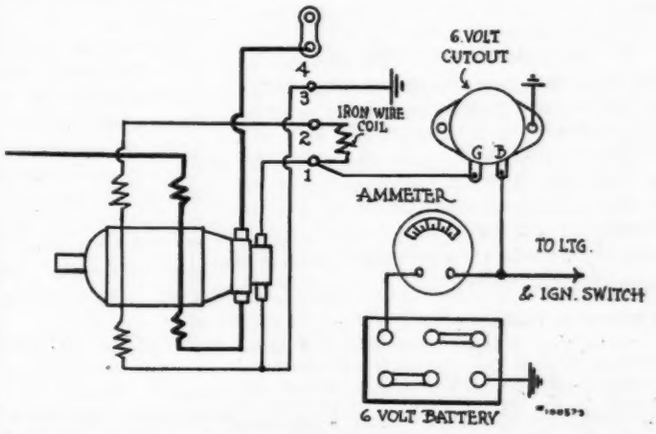


Diagram of the motor-generator on 1913 Cadillac. In using the motor-generator as a generator only, the number four terminal and the heavy connection to the starting switch will not be used.

Analysis of Connecticut Lighting Switch on 1917 Chevrolet

Q—Explain the principle of the Connecticut lighting switch used on the 1917 Chevrolet. How are the series and parallel circuits obtained for getting the dim and bright position for the headlamp? Give diagram of this switch. On a car that we have the bright lights are all right but the dim lights will not work. Where can the trouble be?

1—The operation of the Connecticut switch on the 1917 Chevrolet is shown on this page, two diagrams being given, the one at the left showing the circuits for the headlamps in the parallel or bright position while the sketch at the right shows the circuits for the dim position in which the lamps are wired in series.

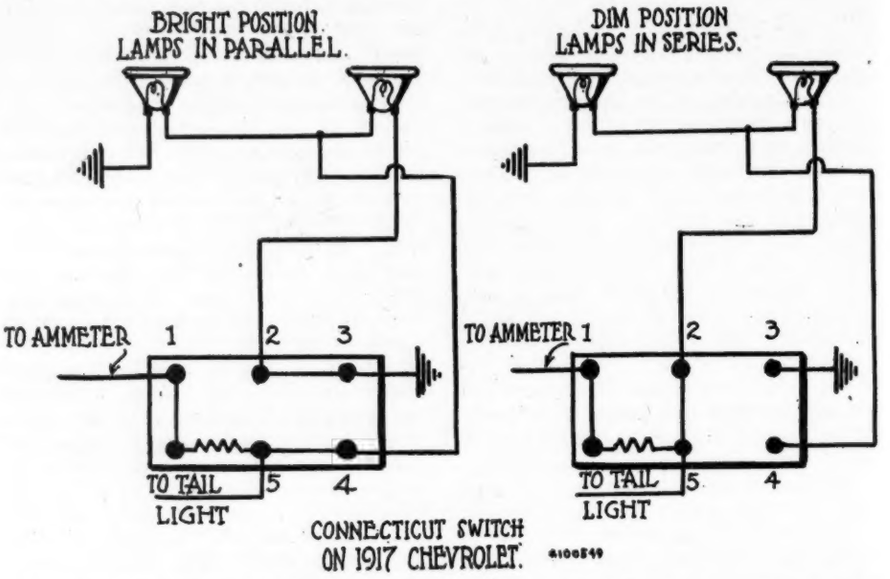
Tracing the circuit at the left the current comes from the ammeter to the No. 1 terminal of the switch and when the on and off button is operated a connection is made down to the left side of the fuse and then the current goes across to the No. 5 terminal and from the 5 terminal through a switch blade to the No. 4 terminal and up to the junction in between the two headlamps.

From this point it goes through the left headlamp to ground and through the right headlamp back to the number 2 terminal on the switch and through another contact in the switch to the number 3 terminal which is grounded.

In the dim position shown in the right hand sketch the circuit is similar until we get to number 5 terminal, the circuit is then through the switch from the 5 terminal to the No. 2 terminal which connects to the right side of the right headlamp from which the current must go through both filaments to ground, thus giving the dim lighting because both lamps are in series across the 6 volt battery.

In this case the number 4 connection to the junction between the two lamps is not used nor is the number 3 ground connection on the switch used. While spending enough time on it might solve the nature of the trouble on your car we would suggest that instead of doing this that you would test the switch to see that it gives you the circuits shown in the sketch.

For example, if in the dim position, or by operating the buttons in all different ways you are unable to get any connection from 2 to 5 through the switch it would explain the trouble and show that it was the fault of the switch. If the switch checks all right, however, and you could get all the circuits shown in the sketch it would then be merely a case of checking the wiring.



Chevrolet Wiring

2—In Fig. 1, page 21 of March 9 Motor Age in which the Chevrolet wiring diagram is given the starting circuit appears to be grounded and yet appears to be a two wire system. What is the reason for this?

2—The usual way of laying out a grounded system is to run a connection from the starting motor to the frame of the car or else to have the starting motor internally grounded so that the bolts which attach it to the engine serve to complete the circuit to the engine and hence to the frame of the car. A heavy cable from one battery terminal to the frame of the car then completes the ground circuit.

In the Chevrolet, however, the heavy cable from the negative battery terminal to the side grounded terminal on the starting motor merely gives the appearance of a two wire system and it is possible that the engineers in laying out this system figured that the conductivity would be better in using copper cable for the entire starter circuit. From an electrical standpoint, however, the system is a one wire or grounded system in spite of appearances to the contrary.

Piston Aligning Gage

3—How can pistons be lined up without piston aligning gage?

3—We have in mind two possible ways of aligning the pistons to see that the connecting rods are straight. One method requires a shaft of steel the same diameter as the crank pins to which the connecting rod is normally attached. With the connecting rod clamped on to this steel shaft a square can be used set on the shaft and up against the side of the piston and if the piston lines up perfectly square with the vertical side of the square it shows that the connecting rod is all right. There is another possible method which does not require the special steel shaft and that is to attach the connecting rod to the crankshaft while the crankshaft is in the engine and then use a square and a flat steel plate placed on the machined surface in between the crankcase and the cylinder block. There will be two general ways of doing this, one where the cylinders are detachable and can be removed leaving a machined surface; another method could be used on the Ford where the cylinder block would be inverted with the lower part of the crankcase removed and the alignment could be checked up with the machined surface at the lower part of the cylinder block which would now be turned upward.

Hand Burnishing Bearings

4—What is meant by hand burnishing of bearings?

4—Hand burnishing of bearings involves rubbing them with a highly polished piece of curved steel about the diameter of a pencil. In other words about 5/16 or ⅜ of an inch in diameter. This is only done after a bearing has been very carefully hand scraped and the rubbing process with a polished piece of rounded steel serves to harden and polish the surface of the babbitt and give it wearing qualities which it would not otherwise have.

Reducing High Voltage

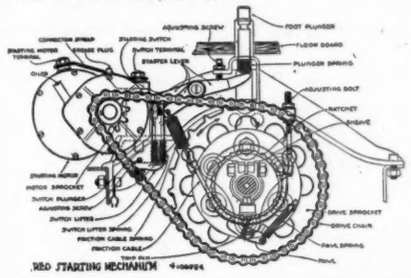
5—Can the high voltage of the current be reduced down to operate a 32 volt drill or other small machinery requiring less voltage? What is meant by the word "phase" and "cycle?"—Cleo Cannon, Avon, Ill.

5—High voltage current by which we assume you mean 110 volt current can be reduced to 32 volts by means of a transformer in case you have alternating current but cannot be changed if it is direct current. However, we suspect the tools you might have which are suitable for 32 volt circuit would be also only suitable for direct current and might not work properly on the transformed alternating current. If you should have such a thing as a Universal 32 volt drill for example, it would work equally well on the 32 volt direct current or the 32 volt alternating current obtained from the step down transformer. Alternating current is current which does not continue to flow in any one direction but keeps reversing very rapidly being in this respect somewhat like the motion of the balance wheel in a watch which merely goes back and forth or might be con-

sidered like the action of a belt over a pair of pulleys if one of the pulleys were acting like the balance wheel in a watch. The ordinary alternating current is known as 60 cycle current because it has 60 complete reversals in a second. In alternating there are times when the current is moving very rapidly or is at what is known as the peak and at other times when it is at a zero value and two currents would be said to be out of phase or out of time if their peak values do not occur at exactly the same instant. Single phase alternating current might be obtained from an alternating current generator in which two connections were brought out while three phase alternating current might be obtained from an alternating current generator in which three connections were brought out from the generating winding. In this case if we should letter the three wires A, B, and C we would have 1 phase from A to B another from B to C and another from A to C and the current obtained on these three phases would not have their high spots at exactly the same instant. Three phase current is usually used for heavy power requirements while single phase current is used for lighting and small power requirements such as small electric drills and small shop tools.

Starting Mechanism on 1919 Reo

Q—Advise as to the nature of trouble we are experiencing on a 1919 four cylinder Reo. The starter works all right with the chain off and it is also possible to crank the engine and the engine runs, but when the starter chain is again installed and the starter switch operated the large sprocket seems to lock so that the starting motor is unable to crank the engine. Show cut of mechanism and advise nature of trouble.—James W. F. Burnett, Greenwood, S. C.



1—Cut of the Reo starting mechanism is shown above. The mechanism comprises chiefly a large sprocket and a pulley with a V groove in it which is attached to the sprocket, both of which are supposed to turn freely. In the groove of the V type pulley, however, there rests a friction cable on one end of which is an adjusting bolt and on the other end a coil spring which is attached to a lever operated by the starting pedal.

If it were not for the drag or binding action of the friction cable the starting motor would turn both the sprocket and the V pulley and no other action would take place. However, the dragging action on the V type pulley is such as to give it a slight turning action with respect to the large sprocket and the design is such that this throws a pawl into mesh with a ratchet wheel so that the large sprocket is then connected to the clutch shaft and cranks the engine. The large sprocket turns on two bearings, a plain bearing at the rear and a roller bearing at the front and it is possible that the plain bearing has seized and is causing the trouble you are experiencing. To check this up it will only be necessary to remove the chain as you have done before and see if you can turn the sprocket freely by hand and if it is difficult to turn this accounts for the trouble.

It is, of course, possible that the trouble is in the starting motor or starting circuits but does not show up when there is no load on the starting motor. We would therefore, suggest that you look over the instructions for shooting starting motor trouble given in any of the recent electrical articles in MOTOR AGE as these will apply near enough to enable you to locate similar trouble on this system.

Checking Ford Valve Timing to Locate Cause of Overheating

Q—What is wrong with this Ford—cylinder block has been reground to 1020" oversize. New pistons and rings have been fitted also a new crankshaft has been installed and the engine has been equipped with a Stewart carbureter and before being overhauled the engine pulled very well but had considerable piston slap. Now it gets hot and gives out on a long hard pull. Also the valves need grinding very frequently. The motor is timed correctly and the car has been run about 2,000 miles since being worked over. The car also rolls very easily.

1—The trouble being experienced with the Ford is apparently characteristic of overheating, and the pitting of the valves which require frequent regrinding also indicates overheating. In spite of the fact that you have checked the timing, we would suggest your checking it again in accordance with the following instructions: Slide a piece of thin paper in between the number 4 exhaust valve stem and the push rod. This will be the valve farthest away from the radiator. Then with all of the spark plugs out crank the engine over slowly by hand till the number 4 valve lifts and again comes down on its seat. The seating of the valve will be noticed by the fact that at the instant it seats you can pull the paper out without tearing so that if a slight pull is exerted on the paper this point is easily found.

At the same time the piston in the number 1 cylinder should be checked to see that it has come to the top of its stroke and has barely started down again. By this we mean that the piston should not be more than 1/64 inch down from its upper position. To check this condition the cylinder head could be removed or if it is not desirable to do this a screw driver can be used through the number 1 spark plug opening to feel the piston position. In checking this it is well to hold the screw driver with the fingers so that the fingers at the same time are touching the cylinder block as in this way a very slight motion can be detected.

The closing of the number 4 exhaust valve as above indicated when the number 1 piston is barely over dead center will show that the camshaft is properly timed. The ignition timing should also be checked with the spark lever pushed up, that is, in its retard position and to do this it would be well to hook up a battery to the ignition system if one is not already present.

With the ignition turned to the battery position the coil should just begin to buzz at the same time that the exhaust valve in the number 4 cylinder just seats which is at the same instant that the number 1 piston is about 1/64 in. down from top dead center. If the coil does not begin to buzz until the piston has moved down perhaps ¼ in. it no doubt, accounts for the trouble you are experiencing.

Running with too lean a mixture will also cause some overheating although it would probably be noted by popping in the carbureter. An overrich mixture is also a common cause of overheating. Such a mixture is easily detected by a strong odor from the exhaust.

In your letter you did not say exactly what type of pistons had been used and if the above suggestions do not correct the trouble would suggest you advise us the exact type as some special pistons require special method of installation, as regards clearance at the skirt and ring lands.

2—Do you think a hotspot manifold would help?—James W. F. Burnett, Greenwood, S. C.

2—While a hotspot manifold would be beneficial we would not believe the absence of such a device would cause the trouble you are experiencing.

REPLACEMENT JETS AND CHOKES FOR ZENITH CARBURETER

Q—Advise what size jets and choke tubes to use in replacing the regular ones in the Zenith carbureter of the old "490" Chevrolet. I have a speedster but it misses at about 65 to 70 m. p. h. and have traced trouble to carbureter. I thought large choke or jets would overcome this, but did not know what size to replace same with.—L. Ramsay, Calgary, Alberta, Can.

1—It is absolutely necessary that you use pressure feed on the gasoline system on this carbureter if you intend to get the maximum speed. The local Zenith maintenance station advises that you change the main jet from a number 90 to number 95 the compensator from a number 95 to 100, idling well to be changed to number 45 and choke from 19 to 20.

When and How to Change Battery Electrolyte

Q—How much acid is required for a solution in each cell of a 6-8 volt storage battery when it is new?

1—New batteries are always supplied with the proper amount of solution which is diluted sulphur acid of gravity of 1280. And unless some of this has been spilled in shipment no acid should be added.

2—As the battery deteriorates with age, say a year old, how much acid is required?

2—No addition of acid is required due to deterioration but when a battery is charged to the point where it gases some of the acid may be splashed out by the gasing process. Before adding acid, however, a battery should be charged until it gases freely and until the voltage of each cell comes up to about 2.5, in other words a six volt battery would be up to 7.5 volts. Then when the battery has been thoroughly charged and the voltage will rise no more and the gravity of the acid does not rise any more it is permissible to dump out all of the old acid if desired and add electrolyte of 1280 gravity. Another way to do would be to add 1400 gravity acid to the old solution, testing it later to see if when mixed it has averaged up to 1280.

3—Do batteries with higher voltage require more acid than a lower voltage battery?

3—The voltage of a battery has absolutely no effect on the kind of electrolite that should be used, if by voltage you mean the difference between a 6 volt battery and a 12 volt battery or between a 12 volt and 32 volt battery, as this difference is due merely to the use of a greater or less number of cells built into the box or case, each cell, however, being independent of the others except that it is connected for use in the outside circuit. In any one cell, however, the gravity of the acid will be 1280 when the cell is fully charged and 1150 when the cell is discharged. This change does not occur due to dumping in or removing acid but is due to a chemical change inside the cell which on discharge allows the sulphate to go into the plates making the acid thinner and on charge drives the sulphate out of the plates making the acid heavier.

4—When it is desired to change the solution, how is the operation performed?—F. W. Lange, Atwood Garage, Atwood, Wisconsin.

4—It should very rarely be necessary to change the solution in a battery. This question is possibly prompted by advertisements for so-called battery solutions which are supposed to give the battery additional life and activity. These are, however, chiefly concentrated sulphur-acid solutions which while they give temporary additional activities do so at the expense of the life of the battery and of the plates and separators which are rapidly destroyed. The treatment given to batteries which have been doped or filled with strong acid is, however, to dump the acid out and fill up the cells with distilled water and put the battery on charge. This drives the strong acid out of the plate into the water changing the water into dilute acid and as the acid gets stronger and stronger it can if necessary be again dumped and water added. This being unnecessary, however, unless the gravity should come up over 1280.

High Rate Discharge Test for Storage Batteries

Q—Describe an inexpensive method of discharging a storage battery after it has been rebuilt with new plates and separators.

1—The usual method of discharging a storage battery is to connect it in series with a carbon plate rheostat and an ammeter. To do this one terminal of the battery would connect to the rheostat the other rheostat terminal to the ammeter and the other ammeter terminal back to the battery so that all three would be wired in series or around in a circle. Adjustment of the rheostat, then adjusts the discharging rate which can be read on the ammeter. A makeshift device might be made with the use of 3/16 in. or ¼ in. iron rod using 12 or 18 ft. of it. It would, of course, be necessary to experiment somewhat and find out exactly what length would be required and if desired a sliding contact could be used on the iron rod by twisting some of the strands from a piece of starter cable around the rod and sliding them back and forth. A high reading ammeter should be used preferably with a scale of 0-500 amperes.

2—At what amperage rate should a battery be discharged?

2—A discharge rate of 100 to 150 amperes is satisfactory and will run the battery down in approximately half an hour this depending, of course, on the size of the battery. A battery is considered charged when the gravity is up to 1280 and is considered discharged when the gravity has dropped to 1150 and the voltage to about 1.80 volts per cell. It would also be well to watch the temperature of the electro-lite by inserting a thermometer as this should not exceed 100 degrees Fahrenheit.

3—How many cycles of charging and discharging should a battery be put through after rebuilding?

3—Two or three cycles of charging and discharging would easily put new plates into a very good condition for use on the car.

4—Can an ammeter be installed on a 1915 or 1916 Cadillac four and at what point are the connections made?

4—Cadillac cars built in 1915 and 1916 were 8 cylinder models. We assume you refer to the 1914 Cadillac which had 4 cylinders. To install an ammeter on this car reference should be made to the motor generator to which four wires are attached, one being a heavy cable and the other three very much smaller. The heavy cable brings the battery current to the motor generator and one of these three smaller wires carries the current up to the instrument board. This one can be determined by flashing from the frame of the motor generator to the three small terminals with a pair of pliers and the one that flashes is the one in which we are interested. The wire from this small live terminal should be cut open at any convenient place and the two ends connected to the two ammeter terminals. The lights should then be turned on and if the ammeter reads charge, the wires on the back of it should be reversed and it will then read discharge. The ammeter will also show the charging current if properly connected for the lights.

5—What engine was used on the 1916 or 1917 Regal four cylinder car? What was the bore and stroke?

5—The four cylinder Regal car model E used a 3.5 in. by 4 in. Port Huron engine while the model D used a 3.75 by 5 in. engine made by the Regal people themselves.

6—Is the Regal car being built at this time?—A Subscriber, Oakland, Calif.

6—The Regal car is no longer built.

INSTALLATION OF AMMETER ON 1914 MOON

Q—We have a Moon car 1914 model which has a 6-volt Delco motor-generator with mercury voltage regulator. The customer claims that he is continually having trouble with the regulator and wishes to put on something else to take its place. He also wishes to install an ammeter to show the generator charging current to the battery. Advise what to use instead of the mercury regulator and how to install the ammeter.—Modern Auto Parts Co., Terre Haute, Ind.

In regard to installing the ammeter would say that we do not believe it is possible to put this on and have it show the net amount of current going to the battery, that is, generator output less the amount used by the lamps but it can be installed to show either the current used by the lamps or the current output of the generator. The latter condition, of course is what the customer is most interested in, that is, how much current the generator is producing and to get this reading the ammeter should be installed in a lead from the number two terminal of the cut-out relay to the number four terminal on the starting switch.

In regard to the mercury regulator would suggest that this be shorted out by connecting the wire that goes to the insulated terminal directly to the frame of the regulator. If this gives too much current output at the speeds at which customer drives the car then it is possible to connect a coil of iron wire in series with this lead before it is connected to the frame of the regulator. We are also writing you in regard to method of controlling generator output.

Full, Three Quarter and Semi-Floating Axles Explained

Q—Explain difference between Full, Three Quarter and Semi-Floating axle. Dodge and Overland 90 call their axle full-floating while the Grant Six which is practically the same, calls its axle three-quarter.—Main Street Garage, Roulette, Pa.

The question is often asked as to the inherent difference between the floating and three-quarter floating and the semi-floating axles. As applied to the modern types of rear axles these names are not strictly correct from an engineering point of view. Many axles which are not floating in the true sense of the term are known as floating type axles. Then there are types which come under the trade name of three-quarter floating designs and which are in reality only semi-floating. As a matter of fact says the Timken-Detroit Axle Co. there are only two types, the floating and the non-floating designs. This may better be understood by comparison. There cannot be several degrees of float any more than there can be several degrees of flying. You either fly or you don't fly. Similarly a body either floats in water or it sinks.

In like manner a rear axle is, strictly speaking, either entirely floating or non-floating. Through general usage in motor car nomenclature the terms designating varying degrees of float in an axle have come to be known, the floating, three-quarter floating and the semi-floating. In Fig. A a full floating axle is shown.

This kind of construction of axle shafts has no function other than transmitting the power received to the differential. They have nothing to do with the sustaining of the load, the housing takes care of this and preventing wheel wobbling. The wheel bearings are on either side of the center line of the wheel and any tendency to bend the axle is resisted by the housing, with no stress coming on the axle shaft which turns freely within the housing. The end of the driving shaft has only a driving connection with the wheel.

Now compare this axle construction with that of the three-quarter floating type so called. This is seen in Fig. B. Usually one bearing is used, and that placed directly under the wheel.

The axle tube extends into the wheel hub, but instead of merely a driving connection, as in the floating type, the axle shaft is rigidly connected to a flange, which in turn is firmly attached to the wheel. Thus any bending stress placed upon the wheel is not carried by the axle housing to any great extent. However, it is a full-floating axle if two bearings are mounted on the axle housing and the shaft is connected to the wheel through a flange, because, due to the fact that a bearing is used on each side of the wheel, most of the strain or bending stresses are put upon the housing instead of on the axle shaft.

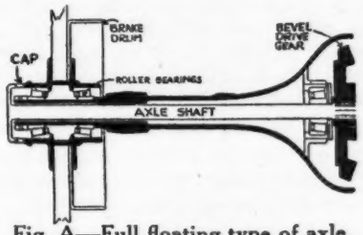


Fig. A—Full floating type of axle

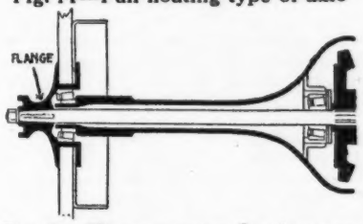


Fig. B—Three-quarter floating type of axle

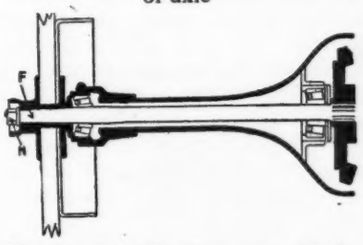


Fig. C—Semi-floating type of axle

The third type, the semi-floating axle, is shown in Fig. C. In this construction the single bearing usually is in from the wheel center line, and it works directly upon the shaft which is fixed to the hub of the wheel. From the sketch, it is evident that this shaft must carry all the load and must stand any bending stresses, this is in addition to doing the driving. Obviously, there is greater chance for wheel wobbling with the semi-floating than with either of the others, and less chance in the floating than in the three-quarter floating design. There are, of course, several modifications of these diagrammatic designs in practice, but they show the essential differences between the three types.

It might be considered that the less the axle shafts are called upon to do, the greater the degree of float. Either design will give satisfactory service, provided it is proportioned properly. Naturally the housing of the floating axle must be heavier than that of either of the other two, and the shafts of the latter two must be heavier than those of the floating type, considering that all three are to carry the same load. If we were to judge the axles mentioned in your letter by the standard, we could justly call the Dodge a full-floating axle and the Grant Six and Overland three-quarter floating type.

Tuning a Paige for Speed

Q—Supply information in regard to getting more speed out of Paige model 6-66 without making radical changes. Would you advance ignition and valves? If so, how much? Would you use extra cylinder head gaskets, if so, how many? How far would you advise clearance on breaker points? This model has Atwater-Kent distributer, what gap would you advise for spark plugs? What change would you advise in carbureter in regard to metering pin and spray nozzle? If any changes in these what number pin or nozzle should be installed?

2—What clearance between push rods, and valve stems?—Edmonds Motor Co., Bloomington, Ill.

1 and 2—The breaker points should be inspected and cleaned with a piece of emery cloth and then set with a gap of not less than .006 and not more than .008. With a retarded spark the points should open at about 1½ inches past top dead center of flywheel. The best position of the spark setting should be found by advancing the spark until the engine pounds on accelerating between five and 25 m. p. h. at wide open throttle then gradually retard spark until pound disappears. In other words it should be set at the point of pounding. The spark plug gaps should be not less than .0023 and not more than .0028. If you intend to run at a maximum speed it is well to increase the valve tappet clearance to .005 for the intake and .006 for the exhaust. The engine must be limber.

It is recommended that the engine be cranked by hand both when cold and when hot. The engine should be absolutely limber under all circumstances and should also show good compression.

The brakes should be absolutely free and it is recommended that two jacks be used under the rear axle so that both wheels are free off the ground, and the brakes so adjusted that when one wheel is rotated in the forward direction, the wheel on the opposite side will turn in the reverse direction. This should be tried on both wheels and all adjusting on the external brakes must be made at the brake bands. When the carbureter is adjusted it should be done so that the best results are obtained.

The time required to accelerate from five to 25 m. p. h. should not exceed eight seconds and will seldom be less than seven seconds. You can obtain proper results if all of the above items be carefully inspected, if necessary call on the carbureter service station in your vicinity to test the carbureter. The installation of larger jets and nozzles is not advised. Any further changes should be in setting the spark slightly farther ahead if the best acceleration is not desired and securing a higher gear ratio. The valve timing should not be molested.

RUBBER BAND FACILITATES WORK WITH PLIERS

A heavy rubber band or a piece of inner tube placed about the handles of a pair of pliers affords a simple means of holding them onto any part, when the hand is removed.

This expedient is of use when small pins such as valve keys are to be held in the pliers, when replacing springs in gas engine valves, or when replacing split cotter pins in places where the fingers cannot reach.

Micrometer Necessary for Accurate Workmanship

Q—In fitting new piston rings in a 1920 model 490 Chevrolet car where the cylinders are in good condition and are not scored would it be advisable to install oversize piston rings? Also advise the required clearance for the top center and the bottom rings, this being the clearance between the ends of the rings.

1—Before using oversize piston rings, the size of the cylinder bore should be checked up with inside micrometer if available and the proper size ring should be used. If an oversize ring is used and has to be cut down by filing at the end so that more than .005 in. of metal has to be removed it will make the ring a poor fit on the cylinder wall as the ring is originally ground to a cylindrical shape and being squeezed together abnormally will give it an elliptical shape which will not fit the cylinder. If inside micrometers are not available it is possible to take a standard piston and insert it in the cylinder bore and use a shim gage between the cylinder and the piston to see how much clearance there is which added to the piston diameter will give the diameter of the cylinder. The clearance for the top ring should be from .004 to .006 in. while the clearance for the other two rings can be from .002 to .004.

Tightening Connecting Rod Bearings

2—With the engine lying on its side in order to adjust the connecting rods on the crankshaft is it satisfactory to take out shims and tighten the bearings to the point where the weight of the piston will just barely move the connecting rod?

2—Whether the fit above described is satisfactory or not depends on the bearing surface and unless the bearing is absolutely a perfect fit on the crankshaft this adjustment would hardly be tight enough. If many shims have been removed would suggest that you coat the surface of the bearing with Prussian blue or other indicating material and see how much of a bearing surface there is and if the bearing is striking the shaft at only a few points it should be scraped in and then the adjustment should be left somewhat tighter than above described. We would suggest that it be so tight that you could just barely move the rods around on the crank by hand without undue effort but we believe that if the weight of the piston swings the connecting rod around that it will soon wear loose enough to produce a knock. We are also writing you in regard to fitting connecting rods to the crankshaft.

Poor Connection in Starting Circuit

3—On a 1915 6-cylinder Buick we are having peculiar starting trouble. When the ignition button is operated the generator will run as a motor so that the gears can be meshed but when stepping on the starting pedal the lights will go out and the generator will stop motoring and everything seems to be dead. Then by again stepping on the starting motor everything may be all right and the starter will crank the engine very rapidly. What is likely to be the cause?—Wisconsin Subscriber, Algoma.

3—The trouble being experienced is apparently due to a poor connection in the starting circuit and we would suggest your inspecting both of the starting motor brushes to see that they make good firm contact with the commutator. This might especially apply to the brush which is operated by the starting pedal as at one time operation of the starting pedal may put out all the lights and apparently kill everything while at another time the starter works all right. Another possibility is that there is a poor connection at either of the battery terminals or at the ground connection at the frame of the car and in case you get the starting motor to misbehave as above described would suggest that you continue to hold your foot on the starting pedal for perhaps 30 seconds. Then quickly feel of the battery connections and the ground connection and see if either of these connections is very hot as this would indicate the location of the trouble. It is obviously a loose connection which sometimes makes contact and again does not make contact.

Instruments for Testing Condensor and Magneto Armature

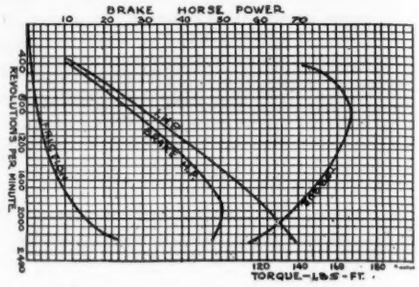
Q—What instruments are needed to test condensor and magneto armatures also motor and generator field coils and armatures.—G. H. Garage, Wakefield, Nebraska.

1—For testing motor and generator armatures we believe the growler is the most universal device and best suited for this work. Names of concerns which can supply equipment of this kind will be given by letter. For the other tests we do not know that any special equipment is needed. For testing a condensor you need 110 volt test points connected to 110 volt circuit with the current to one of the test points coming through a 110 volt lamp so that when the two points are touched together the lamp will light up.

These test points should be brought in contact with the condensor terminals and the lamp should not light up. Then the test points should be brought in contact with the terminals and with each other at the same time, and a snappy spark should be obtained somewhat like the crack of a small whip. This is due to the condensor discharge and shows it to be all right. If the lamp lights up through the condensor it shows the condensor is punctured. To test a high tension magneto armature the interrupter should be removed and the interrupter screw replaced.

A piece of stiff wire should be wrapped around the armature shaft and bent over so as to make a 3/16 spark gap at the slip ring. One terminal of the 6 volt battery should now be connected to the interrupter screw which has been replaced in the armature and a wire from the other battery terminal should be rubbed along the armature. This should give sparks at the 3/16 gap if the armature is in good condition. Field coils of motors and generators are usually tested for grounds and this can be done with the same 110 volt test points which are rigged up for the condensor test.

With normal grounds disconnected and the test points touched one on the frame of the machine and the other on the field coil the lamp should not light up and if it does it shows that a ground is present. Test for shorted coils can best be made by knowing the current that they should draw and then if an excessive current is taken by the field circuits it would indicate a short circuit.



POWER CHARACTERISTICS OF PAIGE

Q—Publish power curve of Paige 6-66 and Paige 6-44, 1922 models.

1—Power curve of the Paige Continental 6-44 shown above. Power curve of the 6-66 is not available. This engine develops approximately 66 h. p. at about 2,700 r. p. m.

2—What are the extreme revolutions these engines will turn over?—Carsten Auto Co., Manson, Ia.

2—The maximum revolutions of the 6-66 is about 3100 and of the 6-44 about 2900.

OIL IN TRANSMISSION GETS INTO CRANKCASE

We are having trouble with an I. H. C. harvester. Inform us what to do to prevent the oil in transmission from entering the crankcase of the Le Roi engine installed on this I. H. C. harvester. The same grade oil is used in transmission as in crankcase as recommended by I. H. C. The oil enters the crankcase faster than it is used.—B. C. Grove, Princeton, Oregon.

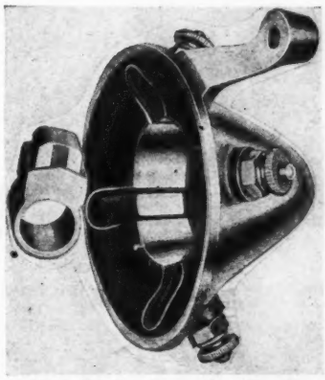
There are no felt or cork washers used in the construction of this harvester to prevent the oil leakage from crankcase to transmission or vice versa. An oil thrower ring is installed on the shaft running through to engine. It is the purpose of this filler ring to prevent an excessive amount of oil from leaking either way. The factory here at Chicago advises us that this trouble must be due to too high an oil level in the transmission case. The oil level in the transmission case should be no higher than the oil level in the crankcase and the oil level in the crankcase should not be any higher than the top pet cock or tricock on the crankcase. If the oil level is maintained at the correct height in the transmission case there will be no flooding of the oil in the engine case.

The ACCESSORY SHOW CASE

New Sources of Retail Profit

NICK-RODE TIMER FOR FORDS

In the Nick-Rode timer for Fords reduction of the linear speed of the rotor has been secured by using a small diameter raceway of unusual width. A feature is the practically continuous raceway which is part of the timer case and is of bronze. The timer case is a bronze casting provided with four equidistant cast-in grooves. Into these grooves are fitted the copper contacts, which are insulated from the case at the bottom by a fiber strip and at the top by the air gap which is secured because the width of the contacts are approximately ⅛ in. less than the width of the timer case grooves. The threaded extensions on the contact points are equipped with the usual type of terminal and are insulated from the case at the outside by a suitable fiber washer. The rotor assembly is also of cast bronze with the rotor element also of bronze. It is claimed the practically continuous metallic raceway tends to greatly reduce arcing at the contacts. The device retails for $2. Thomas Nickell Co., Richmond, Ind.



Nick-Rode timer for Fords

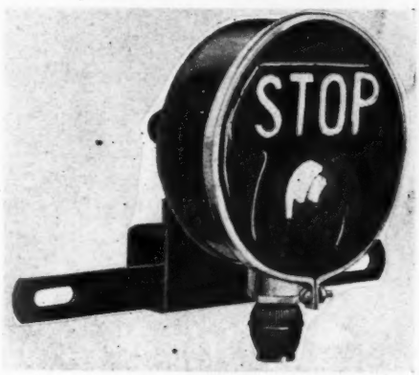
UNIVERSAL MOUNTABLE VENTILATOR

The Universal Mountable Ventilator is made to fit any car and tools for the complete operation, including the hole in the cowl are furnished with each ventilator for $3. Higbee-Orne Co., New Britain, Conn.

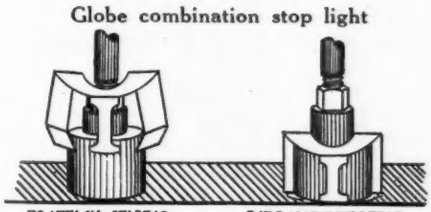
AGATE SIGNAL LIGHT

The Agate Signal Light attaches, in the manner shown, to the tail light already on the car. The body of the lamp is made of aluminum and is faced with red glass on which the letters "stop" appear in black. Price, $5. Agate Auto Appliance, Inc., Chicago, Ill.

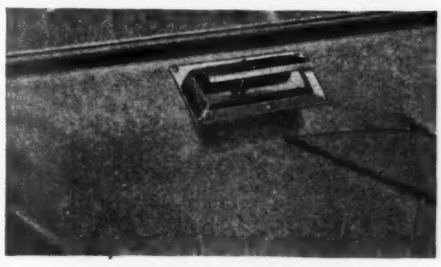
Agate signal light



Globe combination stop light



Superior silencers for Chevrolets



Universal mountable ventilator

WARNER LIQUID SOLDER FOR RADIATORS

This is a solution intended for pouring into the radiator. The label on the can makes the claim that it will "stop leaks in radiators, pump and hose connections, gaskets and water jackets, will not affect the circulation nor clog the radiator. Prevents rust." Warner-Patterson Co., 914 South Michigan Ave., Chicago.

FLORMAN ARTISTIC MOTOR CAR ORNAMENTS

Irving Florman Co., 80 Nassau street, New York has brought out a number of radiator cap ornaments which are reproductions of paintings and statutes. The "Speed Nymph," "Diving Nymph," "Scarecrow" and "Motormeter Nymph" are some of the titles affixed to the ornaments. Each one is made in various sizes.

SAFETY FIRST SIGNAL

The action contemplated by the driver, "left" or "right" turn, "stop" or "safety first" (slow), is flashed upon the signal to the driver behind. The lens are marine hardened with raised red letters on black field. The shell is aluminum, highly polished. The switch is enclosed in a steel switch box. Safety First Auto Equipment Co., 45 Central Office Bldg., Akron, O.

GLOBE COMBINATION STOP SIGNAL AND TAIL LIGHT

The Globe combination stop signal and tail light is made to fit on the regular tail light bracket. A license plate is also supplied with the light. The switch is enclosed in a hard rubber casing, insuring the parts against water damage.

The connector plugs are of brass, nickel-plated. The lens retaining ring, the reflector and deflector are of polished and buffed aluminum. An instruction chart and all parts for installation are included in the price, $5. Globe Machine & Stamping Co., Cleveland.

SUPERIOR SILENCERS FOR CHEVROLETS

Superior Silencers for Chevrolets are made to fit all models of the 490 and FB. The illustration shows their application to the tappet locks, wherein is the noise which, it is claimed, the silencers eliminate. Price $1.50 set of eight. Superior Auto Products Co., New Albany, Ind.

Safety First Signal

SERVICE EQUIPMENT

Aids for Time Saving & Accuracy

APCO REAR WHEEL PULLER FOR FORDS

The pull is exerted on two opposite spokes of the wheel instead of on the threads of the hub. This decreases the time of application. The pointed bolt pushes against the end of the axle shaft. —Apco Mfg. Co., Providence, R. I. Price $5.

WAYNE AIR COMPRESSOR

A new horizontal, air-cooled, two-stage compressor has been put out by the Wayne Tank & Pump Co., Ft. Wayne, Ind.

The plant is fitted with automatic pressure and a moisture unloader. The tank is 14 x 48 in., adapted to 200 lb. working pressure and it is mounted on a frame and fitted with 25 ft. of air hose including all the necessary fittings.

The compressor has two cylinders and two pistons operating independently of each other. In the event of accident to either of the cylinders or pistons, that cylinder and its piston can be disconnected and the compressor can be operated with the other piston and cylinder.

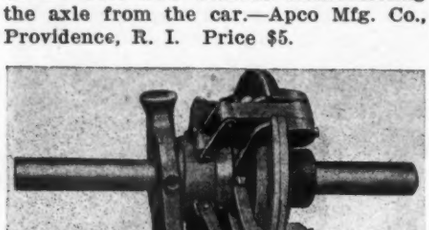
SEPCO ELECTRIC BATTERY STEAMER

The tops of any battery may be safely melted and cells removed in from six to ten minutes. The steamer is automatic in operation. Once the proper amount of water is placed in the boiler and current turned on the automatic pressure gage will turn off the current when 15 lbs. of steam is reached. Only sufficient current to maintain proper steam pressure will be used.

Price, without still is $100, and steamer with still, $130. Automatic Electric Heater Co., Warren, Pa.

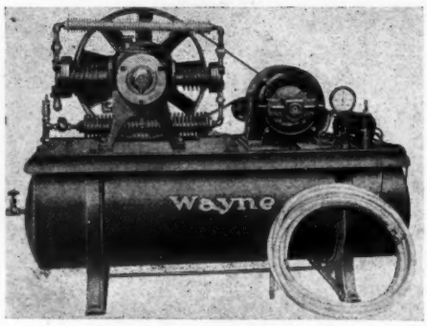
APCO PERCH PUSHER FOR FORDS

The hooks clamp around the front axle under the spring perch and push it through the axle after the nut and cotter pin have been removed. The job can be done without disturbing any other parts of the axle and without disassembling the axle from the car.—Apco Mfg. Co., Providence, R. I. Price $5.



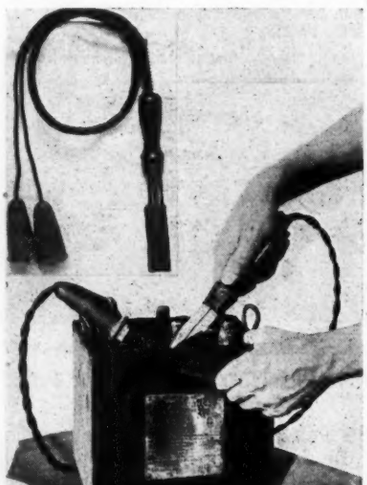
Lists heavy duty clutch

Apco rear wheel puller for Fords



Wayne air compressor

Apco perch pusher for Fords



Hyrate electric hot knife

"U-C-WHAT-U-GET" VISIBLE CONTAINER

The "U-C-What-U-Get" visible container is attachable to any gasoline pump and shows the amount of fuel to be pumped into the car. Avon Specialties Co., Inc., 44 Market Pl., Baltimore, Md.

LIST'S HEAVY DUTY CLUTCH

List's Heavy Duty Clutches are made by the E. J. List Mfg. Co., Havana, Ill.

HYRATE ELECTRIC HOT KNIFE

This is an electrically heated tool with a patented hot blade. The knife carries the heat to the spot needed, and stays hot without reheating.

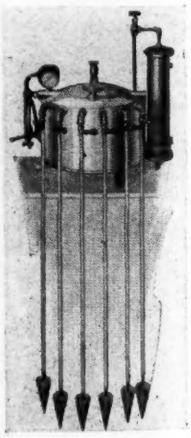
The Hyrate hot knife consists of a blade, handle wire and connections. The insulated clips connect to the poles of a 6-volt battery. The heating element is made of a special alloy, and when heated in the air will not corrode or oxidize.

The blade is securely fitted to a handle; heavy but flexible conductors are attached to the blade, and threaded through the handle. The leads are about ber. At the opposite end they are connected to universal spring clips, by which they can readily be attached to any 6-volt storage battery, or the clips may be removed and the wires connected to a wall switch connected to a permanent battery for the work.—Service Station Supply Co., 30 E. Larned St., Detroit, Mich.

RED DEVIL SOCKET WRENCH SET

This set consists of twenty-seven hexagon and three square sockets which will fit practically every bolt and nut on any car or truck. There is also a ratchet wrench, extension, universal joint, etc. The whole set is packed in a hinged cover wood box.—Smith & Hemenway, Inc., Irvington, N. J.

"U-C-What-U-Get" Visible Container



Sepco electric battery steamer

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Hartford, Conn.	Connecticut Fair Grounds	Sept. 4- 9
Spokane, Wash.	Annual Show	Sept. 4-9
Chicago	Annual Show of the Automotive Equipment Association	Nov. 13-18

RACES

Tacoma, Wash.	Eleventh Annual Race	July 4
Strasbourg	French Grand Prix	July 15
Colo. Spgs., Colo.	Pike's Peak Race	Sept. 4
San Carlos, Cal.	500-Mile Armistice Day Race	Nov. 11

FOREIGN SHOWS

Scheveningen	Automobile Show	May 6-21
Barcelona, Spain	Annual Show	May 24-June 5
Berlin	Kaiserdamm Hall	Sept. 25-Oct. 3
Rio de Janiero	Automotive Exhibition	Sept., 1922
London	International Commercial Vehicle Exhibition	Oct. 12-13
Paris, France	Automobile Show	Oct., 4- 15
London	Annual Show	Nov. 3-11

CONVENTIONS

Colo. Spgs., Colo.	Automotive Equipment Assn.	June 19-24
White Sul'r Spgs., W.Va.	S. A. E. Summer Meeting	June 20-24
Olympia	Washington Automotive Trade Assn.	July 21-22

Minneapolis Garage Owners' Association Gives Timely Service to Its Members

SO far as its functions go, the Minneapolis Garage Owners' Association has undergone a revolution. It has practically only two phases. One is to look after legislation and the other is service. The Minnesota legislature is going to have its biennial session in 1922-1923 and there will be plenty of work to do in that line, in all probability. Just now the association's attorney is taking a case to the supreme court to determine the status of a garage owner's lien in the light of the terms of a conditional sale. This status is not so firmly established as in New Jersey and other states and the garage men want to know definitely whether the dealer's rights shut out those of the garage owner with a lien for a bill against the conditional owner of a car. An early decision is being sought. This is one phase of the legislative work.

While the association was organized rather for a protective association and for the standardizing of prices, it is now extending services to the individual member, with the belief that a garage man should know best what his prices should be for storage, repair work, washing cars, etc., through an adequate system of accounting.

Employment Service

In its new work, however, the association, which numbers 110 members, on call provides for individual firms, without charge, such help as mechanics, floor men, washers, night men, and so on down the list. In the last month Secretary W. J. Johnston has sent out from 150 to 200 mechanics on requests, selected from the registration list at the association office. This registry carries between 400 and 500 names. By keeping this list up to date, a garage member can be given any kind of a workman for his plant on short order.

This is not the only service, as Secretary Johnston has built up a complete list of firms which carry parts, and of firms in all the lines allied to the automobile and accessories business. In fact, the whole industry is cataloged in the office, even orphan cars. Through the various local trade associations, anything a garage dealer member may want and not know where to buy is always looked up and he is told where to go for accessories. If the data is not on hand it is compiled at once.

The association places in the garage of each member, and also outside, a yellow sign on which is printed the name of the Garage Owners' Association of Minneapolis, a cut of a garage and encircling all, the slogan, "Service for the motorist." Inasmuch as the association has now on its roster about 90 per cent of the garage owners, the sign is pretty general throughout the city.

APPLICATION FOR EMPLOYMENT

Name in full.....
Address .....Age.....Phone No.....
Permanent Address .....Owner Renter
How long in Minneapolis.....
How long at present address.....
M..... S..... W.....Children.....
Where Born.....Nationality.....
Naturalized How Citizen.....Long .....
Education .....Trade School.....
Do you use Intoxicating Liquors.....
How much .....
Union .....
No. of years apprenticeship served.....
Where and with whom.....
Wages received .....
How long have you worked as.....
Have you ever worked as Foreman.....
Stock Room experience.....
Garage work .....Lathes.....
Drills .....Ignition.....
Have you any other business.....
Name of particular car most familiar.....
Gas or Electrics.....
Experience with Batteries.....
Have you driven a car.....
How long.....
Are you familiar with the City.....
Name of wife or beneficiary and address .....
Give name of three firms where last employed:
Name..... Dept.....
Address .....
From..... To.....Foreman.....
Name..... Dept.....
Address .....
From..... To.....Foreman.....
Name..... Dept.....
Address .....
From..... To.....Foreman.....
Give below a general description of work you have been doing for the past two years:
.....
.....
.....
Remarks (Not for Applicant): .....
.....
.....
.....
.....

Employment form used to get the right men

SPANISH TRANS-ATLANTIC AIR SERVICE

A SPANISH-SOUTH AMERICAN airship service is being organized, according to the London Times. It is planned to have engineers trained in the works of the Zeppelin Company supervise the construction of the airships in Spain. In that country the whole of the building will be done, and the duralumin for the frameworks of the ships will be made there. Sites for aerodromes have already been taken over near Seville and Buenos Aires. Building will be begun next month.

Three revolving sheds will be put up at Seville, two large ones for the accommodation of three Zeppelin airships and a small shed to take a ship of less cubic capacity, which is to be flown to and from the Canary Islands for the instruction of Spanish airmen. The airships will be larger in volume than the R-38, and they will be driven by nine Maybach engines, each of 400 hp., four on either side of the envelope and one in the stern. The cabin will be placed forward. In it there will be quarters for the pilot and his staff, a salon, a kitchen, and a smoke room. Much space for baggage will be provided along the keel. Forty passengers will be catered for, but it is intended to give the bulk of the available carrying space to mails. A single journey a week will be made each way between Buenos Aires and Seville and the fare will be about £200. The letter fee will be about 18d.

It is hoped to begin regular flights in approximately two year's time.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Acason	¾-1	$1650a	3¾x5	34x5n	34x5n	W
Acason RB	1½	1950	3¾x5½	36x3½	36x6	W
Acason H	2½	2750	4⅜x5¾	36x4k	36x8k	W
Acason L	3½	3450	4⅜x5¾	36x5k	36x10k	W
Acason M	5	4350	5 x6¼	36x6	40x12	W
Ace C	1½	2205	3¾x5½	34x3½k	34x5k	W
Ace A	2½	2795	4¼x5½	36x4k	36x7	W
Acme 20	1	....	3¾x5	35x5n	35x5n	W
Acme 30	1½	....	3¾x5	34x3½	34x5	W
Acme 40	2	....	3¾x5	34x3½	34x5	W
Acme 60	3	....	4¼x5¼	36x4	36x7	W
Acme 60L	3	....	4½x5½	36x4	36x7k	W
Acme 90	4½	....	4½x5½	36x5	40x10	W
Acme 125	6¼	....	4¾x6	36x6	40x12	W
American 25	2½	3350	4 x6	36x4k	36x4dk	W
American 40	4	4275	4½x6	36x5k	36x5dk	W
Armleder 20	1	2350	3¾x5¼	34x3½k	34x5k	W
Armleder 21	1½	2425	3¾x5¼	34x3½	34x6	W
Armleder 40	1½	2850	4½x5¼	34x3½	36x6	W
Armleder HW	2½	3200	4¼x5½	36x4k	36x7k	W
Armleder KW	3½	4150	4½x6	36x5	36x5d	W
Atlas MD	1	1185	3½x5	32x4½n	32x4½n	W
Atterbury 20R	1½	2475	3¾x5	34x3½	34x5	W
Atterbury 7CX	2½	3175	4½x5¼	36x4	36x4d	W
Atterbury 7D	3½	3975	4½x5½	36x5	40x5d	W
Atterbury 8E	5	4975	4¾x6	36x5	40x6d	W
Autocar 21UF	1½-2	1950	4¼x5½	34x4k	34x5k	D
Autocar 21UG	1½-2	2050	4¾x4½	34x4k	34x5k	D
Autocar 27H	2	2950	4 x5½	34x5	36x7	D
Autocar 27K2	2	3075	4 x5½	34x5	36x7k	D
Autocar 26Y	5	3950	4¼x5½	34x6	36x12	D
Autocar 26-B	5	4100	4¼x5½	34x6	36x12	D
Available H1	1½	2475	4 x5	36x3½k	36x5k	W
Available H2	2	2775	4 x5	36x3½k	36x6k	W
Available H2½	2½	3160	4 x5	36x4k	36x8k	W
Available H3½	3½	4175	4½x5½	36x5	40x5d	W
Available H5	5	5375	5 x6	36x6	40x12	W
*Avery	1	....	3 x1s	34x5n	34x5n	I
Beck A Jr.	1	1850	3½x5	32x4½	33x5	I
Beck B-30	1½	2050	3¾x5	34x5	36x6	
Beck C-40	2	2150	3¾x5	36x6	36x6	
Beck D-50	2½	2850	4½x5¼	38x7	40x8	
*Bell (Penn.)	½	1000a	3½x5	31x4n	31x4n	B
Bell M (Iowa)	1	1495	3½x5½	35x5	35x5n	W
Bell E (Iowa)	1½	2100	3¾x5¼	34x3½	34x5	I
Bell O (Iowa)	2½	2550	4½x5½	34x4	34x6	I
Belmont A	½	725	3¾x4¼	31x4	31x4	B
Belmont D	2	2575	4¼x5½	34x3½k	34x6k	I
Belmont F	3	3500	4 x6	36x5k	36x5dk	I
Bessemer G	1	....	3½x5	35x5n	35x5n	I
Bessemer H-2	1½	....	3¾x5	36x3½	36x5	I
Bessemer J-2	2½	....	4½x5¼	36x4	36x4d	I
Bessemer K-2	4	....	4½x5½	36x5	36x10	I
Brinton C	1½	1500	3¾x5	34x4	34x5	W
Brinton D	2½	2250	4¾x5¼	36x4	36x7	W
Brockway E	1	....	3¾x5½	35x5n	35x5n	B
Brockway S-5	1½	....	3¾x5	36x3½k	36x5k	W
Brockway SK	1½	....	4¼x5¼	36x4	36x6	W
Brockway KR	2½	....	4½x5½	36x4	36x8	W
Brockway K-5	2½	....	4½x5¼	36x4	36x8	W
Brockway RT	3½	....	4¾x6	36x5	36x10	W
Brockway R-4	3½	....	4½x5½	36x5	36x5d	W
Brockway T-4	5	....	4¾x6	36x6	40x6d	W
*Buick	...	945b	3⅝x4¾	31x4n	31x4n	B
Capitol G1	1½	2975	3¾x5	35x5	38x7	W
Capitol H2	2½	3700	4¼x6	36x4	36x8	W
Capitol K2	2½	4250	4¼x6	36x6	42x9	W
Capitol M3	3½	4425	4¼x6	36x5	36x10	W
Case	2	....	4¼x5¾	36x6	38x7	I
*Champion	½	1050b	3½x5	32x3½	32x3½	I
*Chevrolet G	¾	745	3¼x4	31x4n	34x4½n	B
*Chevrolet T	1	1125	3¼x5¼	33x4n	35x5n	W
Chicago C1	1½	....	4 x5	36x3½k	36x5k	W
Chicago C2	2½	....	4 x5	36x4k	36x7k	W
Chicago C3	3½	....	4½x5½	36x5	36x10	W
Chicago D5	5	....	4½x5½	36x6	40x12	W
Climber A-20	1½	2050	3½x5	36x6k	38x7k	I
Clydesdale 10	¾-1¼	1485	3¾x5	34x5n	34x5n	B
Clydesdale 18	¾-1¼	1890	3¾x5	34x5	34x5	W
Clydesdale 20	1-1½	2385	3¾x5	34x5	34x5k	W
Clydesdale 42	1½-2	2475	3¾x5	36x3½	36x6	W
Clydesdale 65X	2½-3	3250	4½x5¼	36x4	36x8	W
Clydesdale 65EX	2½-3	3150	4½x5½	36x4	36x8	W
Clydesdale 90	3½-4½	4100	4½x5½	36x5	36x10	W
Clydesdale 120	5-6	4500	4¾x6	36x6	40x12	W
Columbia H	1½	1895	4 x5	35x5	38x7n	I
Columbia G	2½	2335	4 x5¼	36x4	36x7	I
Comet T	1½	1950	3¾x5	34x4	34x4	W
Commerce T	¾-1½	1450	3¾x5	34x4½n	34x4½n	B
Commerce 12	1½	1800	3¾x5	35x5n	35x5n	I
Commerce 16	2	2150	3¾x5	35x5n	36x6	I
Commerce 18	2½	2495	4¼x5¼	36x6n	36x7n	I
Commerce 25	2½	2425	4½x5¼	36x4	36x7	W
Concord A	2	3150	4 x5½	36x3½k	36x6k	W
Concord B	3	3600	4¼x5½	36x4	36x8k	W
Concord AX	2	3250	4 x5½	36x3½	36x6	W
Concord BX	3	3600	4½x5½	36x4	36x8	W
Cook 51	2½	3600	4 x5⅛	36x6n	40x8n	W
Corbitt E-22	1	1480	3¾x5	34x3½	34x4	W
Corbitt D-22	1½	2200	3¾x5	34x3½	34x4	W
Corbitt C-22	2	2600	4¼x5¼	36x3½	36x6	W
Corbitt B-22	2½	3000	4¼x5¼	36x4	36x7	W
Corbitt R-22	3	3200	4½x5½	36x4	36x8	W
Corbitt A-22	3½-4	3800	4½x5½	36x5	36x10	W
Corbitt AA-22	5	4500	4¾x6	36x6	40x6d	W
Day-Elder AS	1	1600	3¾x5	35x5n	35x5n	W
Day-Elder B	1½	$2000	3¾x5	34x3½	34x5	W
Day-Elder D	2	2400	4½x5¼	36x4	36x7	W
Day-Elder C	2½	2750	4¼x5½	36x4	36x7	W
Day-Elder F	3½	3150	4½x5½	36x5	36x5d	W
Day-Elder E	5	4250	4½x6	36x5k	40x6dk	W
Dearborn E	1	1600	3⅝x5½	35x5n	35x5n	W
Dearborn FX	1½	2300	3¾x5⅛	34x4	34x5	W
Dearborn F	1½	2180	3¾x5½	34x4	34x5	W
Dearborn 48	2	2590	3¾x5½	34x4½n	34x7	W
Defiance G	1	1695a	3¾x5	35x5n	35x5n	B
Defiance D	1½	2095a	3¾x5	35x5n	36x6n	I
Defiance E	2	2275a	3¾x5	35x5n	38x7n	I
Denby 31	1¼	1485	3½x5	35x5n	35x5n	B
Denby 33	1½	2145	3¾x5	35x5n	38x7n	I
Denby 34	2	2395	3¾x5	36x3½	36x6	I
Denby 35	2½-3	2795	4½x5¼	36x4	36x7	I
Denby 27	4	3895	4½x5½	36x5	36x5d	I
Denby 210	5	4295	4½x5½	36x6	40x6d	I
Dependable A	¾-1	1650	3⅝x5⅛	34x5n	36x6n	W
Dependable C	2	2350	3¾x5¼	34x3½	34x5	W
Dependable D	2½	2650	4 x5½	34x5	36x6	W
Dependable E	3	2950	4¼x5½	36x4	36x7	W
Diamond T O-8	1-1¼	1975	3¾x5¼	36x3½n	36x4n	W
Diamond T T	1½	2250	3¾x5¼	36x3½	36x5	W
Diamond T U	2-2½	2650	4 x5¼	36x4	36x7	W
Diamond T K	3½	3750	4¼x5½	36x5	36x5d	W
Diamond T EL	5	4325	4½x5½	36x6	40x6d	W
Diamond T S	5	4500	4¾x6	36x6	40x6d	W
*Diehl A	1	....	3½x5	34x4½	35x5	I
Diehl B	1½	....	3½x5	36x6	36x6	I
Doane	2½	4100b	4¼x5¾	36x5	36x7	C
Doane	3½	5100b	4⅜x5¾	36x5	36x5d	C
Doane	6	6000b	5 x6¼	36x6	40x6d	C
*Dodge Brothers	½	730	3⅞x4½	32x4n	32x4n	B
Dorris K-4	2-2½	3400	4¼x5½	36x4	36x7	W
Dorris K-7	3½	4400	4¼x5½	36x5	36x10	W
*Dort 103	½	685a	3½x5	31x4n	31x4n	B
Double Drive B	3	4000	4¼x5½	6	6	W
Duplex A	2	2775	4 x5¼	35x5n	38x7n	W
Duplex E	3½	3500	4¼x5½	36x8	36x8	I
Duty 22	2	1590	3½x5	34x3½	34x5	I
Eagle 101	1½	1875	3⅝x5½	34x5	34x5-	I
Eagle 100-2	2	2275	3¾x5¼	34x4k	34x7k	I
F. W. D. B	3	4200	4¾x5½	36x6	36x6	B
Fageol 1½	1½	3000	3¾x5¼	34x3½k	34x6k	W
Fageol 2½	2½	3900	4¼x5¾	34x4	36x7	W
Fageol 3½	3½	5000	4½x6¼	36x5k	40x5dk	W
Fageol 5	5	5700	4½x6¼	36x6	40x6d	W
Fargo R	2	1700	3¾x5	36x4	36x6	I
Federal SD	1½	1800	3¾x5	35x5n	36x6n	W
Federal TE	1½	2175	4¼x5¼	36x3½	36x5	W
Federal UE	2-2½	2425	4¼x5¼	36x4	36x7	W
Federal WE	3½-4	3150	4½x5½	36x5	36x5d	W
Federal X2	5-6	4500	4¾x6	36x6	40x6d	W
*Ford TT	1	430	3¾x4	30x3½n	32x4½n	W
Front Drive C	1½	2800	3¾x5½	5	4	W
G & J** 20	1	2275	3⅝x5½	34x5n	34x5n	W
G & J** A	2-2½	3375	4¼x5¼	36x4	36x7	W
G & J** B	3½-4	4475	4½x5½	36x5	36x10	W
G.M.C. K16	1	1295	3½x5	34x5n	34x5n	B
G.M.C. K-41A	2	2375	4 x5½	36x4k	36x7k	W
G.M.C. K-41B	2	2375	4 x5½	36x4k	36x7k	W
G.M.C. K-71A	3½	3600	4½x6	36x5	40x5d	W
G.M.C. K-71B	3½	4050	4½x6	36x5	40x5d	W
G.M.C. K-101A	5	3950	4½x6	36x5	40x6d	W
G.M.C. K-101B	5	4450	4½x6	36x5	40x5d	W
G.W.W.	1½	1850	3¾x5½	35x5	35x5	I
*Garford 15	¾	1590	3⅝x5½	34x5n	34x5n	W
Garford 25-B	1¼	1990	3¾x5½	36x6n	36x6n	W
Garford 70-H	2	2750	4¼x5½	36x4	36x7	W
Garford 77-D	3½	3750	4½x6	36x5	36x6d	W
Garford 68D	5	4500	5 x6¼	36x6	40x6d	W
Garford 150-A	7½	5200	5½x6	36x6	40x7d	C
Gary F	1-1½	1675	3¾x5	36x3½	36x4	W
Gary I	2	2250	4 x5½	36x3½	36x6	W
Gary J	2½	2650	4¼x5½	36x4	36x8	W
Gary K	3½	3650	4½x6	36x5	40x5d	W
Gary M	5	4100	5 x6¼	36x6	40x6d	W
Gersix M	1½	3100	4 x5½	36x3½	36x7	W
Gersix K	2½	3500	4½x5½	36x4	36x8	W
Gersix	3½	4500	4½x6	36x5	40x12	W
Graham Bros.	1	1265	3½x4½	33x4½n	34x5n	B
Graham Bros.	1½	1325	3½x4½	33x4½n	36x6n	B
Gramm-Pion. 10	1	1365	3½x5	33x5n	33x5n	B
Gramm-Pion. 15	1½	1900a	3¾x5	36x3½k	36x5k	I
Gramm-Pion. 25	1½	2500a	3¾x5	36x3½k	36x5	W
Gramm-Pion. 20	2	2925a	4¼x5¼	36x4k	36x7k	W
Gramm-Pion. 30	3	3275a	4¼x5½	36x4k	36x4dk	W
Gramm-Pion.75P	3½	4225a	4½x5½	36x6n	42x9n	W
Gramm-Pion. 40	4	3995a	4½x5½	36x5	36x5dk	W
Gramm-Pion. 50	5-6	4895a	4¾x6	36x6	40x6dk	W
Hahn B2	1	1700a	3½x5	34x5k	34x5k	W
Hahn O	1½	1900	3¾x5¼	36x3½k	36x6k	W
Hahn K	2	2275	4¼x5½	36x7k	36x5k	W
Hahn L	3	2900	4½x5½	36x5k	36x8k	W
Hahn M	5	3500	4½x5½	36x5	36x10	W
Hahn N	6	4500	4¾x6	36x6	40x12	W
Hal-Fur E	1½	$2350	4 x5½	34x5n	38x7n	W
Hal-Fur B	2½	3000	4¼x5½	36x6n	36x8	W
Hal-Fur F	3½	4000	4½x5½	36x6n	40x10	W
Hall 1½	1½	3100	3¾x5	34x5n	38x7n	W
Hall 2½	2½	3275	4¼x5¼	36x4	36x6	W
Hall 3½	3½	4100	4½x5½	36x5	36x6d	W
Hall 5	5	5100	4½x5½	36x5	40x6d	W
Hall 7 chain	7	5100	4½x5½	36x5	40x6d	G
Harvey WOA	2	2650	4¼x5½	34x4	34x7	W
Harvey WFA	2½	2950	4¼x5½	36x4	36x7	W
Harvey WHA	3½	3950	4½x6	36x5	36x5d	W
Hawkeye K	1½	1850	3¾x5½	34x3½k	34x5k	I
Hawkeye M	2	2650	4¼x5	36x4k	36x6k	I
Hawkeye N	3½	3700	4½x6¾	36x5k	36x10k	I
Hendrickson O	1½	2200	3⅝x5½	36x4n	36x5n	W
Hendrickson N	2½	2690	4¼x5¾	36x4k	36x7k	W
Hendrickson M	3½	3000	4¼x5	36x5k	36x5dk	W
Hendrickson K	5	4000	5 x6¼	36x6	40x6	W
Hurlburt A	1½	2850	4 x5½	34x4	34x5	W
Hurlburt B	2½	3750	4¼x5½	36x4	36x4d	W
Hurlburt C	3½	4590	4½x6	36x5	36x5d	W
Hurlburt D	5	5500	4½x6	36x5	40x6d	W
Indep'd't(Iowa), B	1	1665	3½x5	34x3½	34x4	I
Indep'd't(Iowa) G	1½	2040	3¾x5¼	34x3½	34x5	I
Indep'd't(Ia.) H1	2½	2910	4½x5¼	36x4	36x4	I
Indep'd't(Ohio) F	1½	2385	3¾x5	36x4	36x4d	W
Indep'd't(Ohio) H	2½	3085	4¼x5¼	36x4	36x5d	W
Indep'd't(Ohio) K	3½	3985	4½x5½	34x3½k	34x5k	W
Indiana 12	1½	....	3¾x5¼	36x4k	36x7k	W
Indiana 20	2	....	4½x5½	36x4k	36x8k	W
Indiana 25	2½	....	4½x5½	36x5k	36x5dk	W
Indiana 35	3½	....	4¾x5½	36x5k	40x6dk	W
Indiana 51	5	....	5 x6¼	36x5k	40x6dk	W
*International S	¾	1500	3½x5	34x5n	34x5n	I
International 21	1	1750	3½x5¼	36x3½	36x3½	I
International 31	1½	1850	3½x5¼	36x3½	36x4	I
International 41	2	2100	3½x5¼	36x3½	36x5	I
International 61	3	2400	4¼x5	36x4	36x6	I
International 101	5	3600	4¾x5	36x5	40x10	I
Jackson 4WD	3½	3850	4½x5½	36x7	36x7	B
Jumbo 15	1½	2295	3¾x5¼	36x3½	36x5	I
Jumbo 20	2	2520	3¾x5¼	35x5n	38x7n	I
Jumbo 25	2½	2660	4½x5½	36x4	36x7	I
Jumbo 30	3	3060	4¼x5½	36x6n	42x9n	I
Jumbo 35	3½	3900	4½x6	36x5	36x10n	I
Jumbo 40	4	4460	4½x6	38x7n	44x10	I
K-Z 1	1	1750	3½x5	34x3½	34x5	W
K-Z 1½	1½	2075	3¾x5	36x4	36x6	W
K-Z 2	2½	2550	4¼x5¼	36x4	36x8	W
K-Z 3	3½	3350	4½x5½	36x5	40x10	W
K-Z 5	5	3850	4½x5½	36x6	40x6d	W
Kalamazoo G-1	1½	2495	3¾x5	34x4	34x5	W
Kalamazoo G-2	1½	2800a	3¾x5	36x4	36x6	W
Kalamazoo H	2½	3275a	4 x6	36x4	36x8	W
Kalamazoo K	3½	4000a	4¼x6	36x5	36x10	W
Kalamazoo K-5	5	4500a	4½x6	36x6	36x6d	W
*Kearns H	1	1150	3½x5	32x4½n	32x4½n	I
Kearns N	2	1650	3½x5	34x3½	34x6	I
²Kelly-S. K-31	1½	2700	3¾x5¼	36x3½	36x6	C
²Kelly-S. K-34	1½	2700	3¾x5¼	36x3½	36x6	W
²Kelly-S. K-38	2½	2900	3¾x5¼	36x4	36x4d	W
²Kelly-S. K-35	2½	2900	3¾x5¼	36x4	36x4d	C
²Kelly-S. K-40	3½	3900	4½x6½	36x5	40x5d	C
²Kelly-S. K-41	3½	3900	4½x6½	36x5	36x10	I
²Kelly-S. K-42	3½	3900	4½x6½	36x5	40x5d	W
²Kelly-S. K-50	5	4400	4½x6½	36x6	40x6d	C
²Kelly-S. K-60	6	4500	4½x6½	36x6	40x7d	C
Keystone 40	2	2175	3¾x5⅛	34x5n	38x7n	I
Kimball AB	2	3675	4 x6	36x4	36x7	W
Kimball AC	2½	3975	4¼x6	36x4	36x8	W
Kimball AK	3	4500	4½x6	36x4	36x10	W
Kimball AE	4	5000	4¾x6	36x5	40x12	W
Kimball AF	5	5500	5 x6	36x6	40x7d	W
*Kissel Express	1	1585	3⅞x5½	34x5n	34x5n	W
Kissel Utility	1½	1975	3⅞x5½	36x3½	36x5	W
Kissel Freighter	2½	2875	4¼x5½	36x4	36x7	W
Kissel H. D.	4	3675	4¼x5½	36x5	36x5d	W
Kleiber AA	1	2200	4¼x5¼	34x3½k	34x5k	W
Kleiber A	1½	3100	4¼x5¼	36x3½k	36x6k	W
Kleiber BB	2	3600	4¼x5¼	36x4k	36x7k	W
Kleiber B	2½	3950	4½x5½	36x5k	36x8	W
Kleiber C	3½	4600	4½x5½	36x5	36x5d	W
Kleiber D	5	5300	5 x6½	36x6	40x12	W
Koehler D	1½	1995	3½x5	34x3½	34x5	W
Koehler M	2½	3175	4 x5½	36x4	36x7	W
Koehler MCS	2½	3275	4 x5½	36x4	36x7	W
Koehler F	3½	4150	4½x5½	36x5	36x10	W
Koehler MT. Trac	5	3375	4 x5½	36x4	36x7	W
Krebs-Collier 23	¾	1260	3¾x5	34x4½	34x4½	B
Krebs-Collier 24	1	1565	3¾x5	34x5	34x5	W
Krebs-Collier 45	1½	2125	4¼x5¼	36x4	36x7	W
Krebs-Collier 75	2½	2375	4½x5½	36x4	36x8	W
Krebs-Collier 110	3½	2975	4½x5½	36x5	40x10	W
Larrabee X-2	1	1925	3¼x4½	34x5n	34x5n	B
Larrabee U	1½	2400	3¾x5	34x3½	34x5	W
Larrabee J	1½-2½	2400	3¾x5	34x3½k	34x5k	W
Larrabee K	2½	3100	4¼x5½	36x4	36x7	W
Larrabee K-5	2½-3	3450	4½x5½	36x4	36x8	W
Larrabee L-4	3½	4000	4½x5½	36x5	36x5d	W
Larrabee W	5	4800	4¾x6	36x6	40x6d	W
Maccar L	1½	2700	4¼x5¼	36x4	36x6	W
Maccar H-A	2	3400	4¼x5¼	36x4	36x4d	W
Maccar H-2	3	3400	4½x5½	36x4	36x5d	W
Maccar H-3	4	4200	4½x5½	36x5	36x6d	W
Maccar G	5-6	4950	4¾x6	36x5	40x6d	W
MacDonald A	7½	5750	4½x6	40x7	40x14	I

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm.
r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment. b—price includes body. *—speed truck or delivery wagon. **—Canadian Make. trac.—tractor.

1—Gramm-Pioneer. 2—Kelly-Springfield.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Mack...AB D.R.	1½	$3150	4 x5	36x4	36x3½d	D
Mack...AB Chain	1½	3000	4 x5	36x4	36x3½d	C
Mack...AB Chain	2	3300	4 x5	36x4	36x4d	C
Mack...AB D.R.	2	3750	4 x5	36x4	36x4d	D
Mack...AB D.R.	2½	3850	4 x5	36x4	36x4d	D
Mack...AB Chain	2½	3100	4 x5	36x4	36x4d	C
Mack...AC Chain	3½	4950	5 x6	36x5	40x5d	C
Mack...AC Chain	5	5500	5 x6	36x6	40x6d	C
Mack...AC Chain	6½	5750	5 x6	36x6	40x12	C
Mack...AC Chain	7½	6000	5 x6	36x7	40x7d	C
Mack Trac...AB	5	3400	4 x5	36x4	36x4d	C
Mack Trac...AC	7	4950	5 x6	36x5	40x5d	C
Mack Trac...AC	10	5500	5 x6	36x6	40x6d	C
Mack Trac...AC	13	5750	5 x6	36x6	40x12	C
Mack Trac...AC	15	6000	5 x6	36x7	40x7d	C
Mapleleaf...AA**	2	3775	4 x5½	36x4	36x7	W
Mapleleaf...BB**	3	4350	4 x5½	36x4	36x4d	W
Mapleleaf...CC**	4	5100	4½x5½	36x5	36x5d	W
Mapleleaf...DD**	5	6200	4½x5½	36x6	40x6d	W
Master.....JW	1½	2200	4½x5½	34x3½	34x5	W
Master.....JD	1½	2590	4½x5½	34x3½	34x5	D
Master.....Z	2	2290	4½x5½	34x3½	34x5	W
Master.....W	2½	2890	4½x5½	34x4	36x7	W
Master.....DD	2½	3190	4½x5½	34x4	36x7	D
Master.....A	3½	3090	4½x6	36x5	40x5d	W
Master.....E	3½	4290	4½x6	36x5	40x5d	D
Master.....Y	4	4490	4½x6	36x5	40x6d	D
Master.....B	5	4990	4¾x6½	36x6	40x6d	W
Master.....F	5	5090	4¾x6½	36x6	40x6d	D
MasterTrac.,DDT	6	3390	4½x5½	34x4	36x7	D
*Maxwell.....1½	1½	932	3⅝x4½	32x3n	32x4n	W
Menominee...HT	1–1¼	2000	3½x5	34x3½	36x5	W
Menominee...H	1½	2475	4 x5	36x3½	36x5	W
Menominee...D	2–2½	2875	4 x6	36x4	36x8	W
Menominee...G	3½	3800	4½x6	36x5	36x10	W
Menominee...J-3	5	4250	4¾x6	36x6	40x12	W
Moline.....10	1½	1985	3½x5	34x5n	36x6n	J
*Moreland...R. R.	1	1595	4 x5	34x5n	34x5n	B
Moreland.....BX	1½	1980	4 x5	30x3½	36x6k	W
Moreland.....EX	2	2800	4½x5½	36x4	36x7k	W
Moreland.....AX	3	3500	4½x5½	36x5	36x10k	W
Moreland.....RX	4½–5	4600	4¼x6	36x6	40x6	W
Napoleon.....7	¾	1350	3½x5	33x4	33x4n	I
Napoleon.....9	1	1535	3½x5	35x5k	35x5k	I
Napoleon.....11	1½	1860	3½x5	35x5k	36x6k	I
Nash.....2018	1–1½	1595	3¾x5¼	35x5	36x6	I
Nash.....3018	2–2½	2150	3¾x5¼	36x6	40x8	I
Nash.....Quad.	2–2½	2750	4¼x5¼	40x8	40x8	I
Nash..3018, LWB	2–2½	2200	3¾x5¾	36x6	40x8	I
Nash.Quad.LWB	2–2½	2800	4¼x5½	40x8	40x8	I
Nash.....5018	2½	2250	3¾x5¼	34x4	34x6	I
*Nelson.....G2	1½	....	4½x5¼	36x3½	36x6	W
*Nelson.....G3	2½	....	4½x5¼	36x4	36x7	W
*Nelson.....G4	3½	....	4½x5½	36x5	36x5d	W
*Nelson.....G5	5	....	4¾x6	36x6	40x6d	W
Netco.....DK	2	3100	4¼x5¼	36x4k	36x7k	W
Netco.....HI	2½	3500	4½x5½	36x4k	36x8k	W
New York...M	1½	....	4½x5¼	36x3½	36x5	W
New York...N	2–2½	....	4½x5¼	36x4	36x4d	W
Niles.....E	2	3000	4½x5¼	36x4k	36x7k	W
Noble.....B30	1½	....	3¾x5¼	36x3½	36x5	W
Noble.....C10	2	....	4 x5½	36x4	36x7	W
Noble.....D50	2½	....	4¼x5½	36x4	36x8	W
Noble.....E70	3½	....	4½x6	36x5	36x10	W
Northwestern..W	1½	2700	4½x5¼	34x4	36x6	W
Northwestern..WS	2½	3500	4½x5½	36x4	36x8	W
Norwalk.....25E	1	1595	3½x5	34x3½	34x4	W
Norwalk.....35E	1½	1925	3½x5	34x3½	34x3½d	W
Norwalk,35E.Spec	1½	2285	3¾x5¼	34x3½	34x5	W
O. K.....K1	1½	2450	4 x5½	36x3½	36x5	W
O. K.....L1	2½	3250	4¼x5½	36x4	36x8	W
O. K.....M1	3½	4250	4½x6	36x5	36x5d	W
Ogden.....D	½	....	3¾x5	36x3½	36x5	W
Ogden.....D	1½	....	3¾x5	36x3½	36x5	W
Ogden.....E	2½	....	4½x5¼	36x4	36x8	W
Old Hickory...W	1	1775	3¾x5	36x3½k	36x4k	W
Old Reliable...A	1½	2350	4 x5	34x4	36x6	W
Old Reliable...B	2½	3500	4¼x6	34x4	36x4d	W
Old Reliable...C	3½	4250	4¼x6	36x5	36x5d	W
Old Reliable...D	5	5250	4¾x6	36x6	40x6d	W
Old ReliableKLM	7	6000	4¾x6½	36x6	40x7d	C
*Oldsmobile Econ	1	1095	3¼x5¼	35x5n	35x5n	I
Olympic.....A	2½	3200	4¼x5½	36x4	36x8	W
Oshkosh.....A	2	3250	3½x5	36x6n	36x6n	B
Oshkosh.....AA	2	3400	3½x5	36x6n	36x6n	B
Oshkosh.....B	2½	3850	4 x5⅛	38x7n	38x7n	B
Oshkosh.....BB	2½	4000	4 x5⅛	38x7n	38x7n	B
*Overland.....4	½	450	3⅜x4	30x3½n	30x3½n	B
Packard.....EC	1½–3	3100	4½x5½	36x4	36x7	W
Packard.....EX	1½–3	3100	4½x5½	36x6n	40x8n	W
Packard.....ED	2–4½	4100	4½x5½	36x5	36x5d	W
Packard.....EF	4–7½	4500	5 x5½	36x6	40x6d	W
Paige.....52-19	1½	1950	4 x5¼	34x3½	34x5	W
Paige.....54-20	2½	2420	4¼x5½	34x4	34x8	W
Paige.....51-15	3½	3145	4½x5½	36x5	36x5d	W
Parker.....C-22	1	1875	3¾x5¼	34x5n	34x5n	W
Parker.....G-22	2½	3200	4¼x6	34x4	36x4d	W
Parker.....J-20	3½	3950	4½x6	36x5	40x5d	W
Parker.....M-20	5	4850	5 x6	36x6	40x6d	W
Patriot...Revere	1	1380	3¾x5	35x5n	35x5n	W
Patriot...Lincoln	2	2050	4 x5¼	34x3½	34x5	W
Patriot .Washington	3	2900	4½x5½	36x4	36x7	W
Pierce-Arrow....	2	3200	4 x5½	36x4	36x4d	W
Pierce-Arrow....	3½	4350	4½x6¾	36x5	36x5d	W
Pierce-Arrow....	5	4850	4½x6¾	36x5	40x6d	W
Pittsburgher....	1½–2	3000	3⅝x5	36x4	36x6	..
Pittsburgher....	3	3800	4½x5¼	36x5k	36x8	W
Power.....F	2	$3150	3¾x5¼	36x5	36x7	W
Power.....C	3½	4250	4¼x5½	36x5	40x10	W
*Rainier...R-21	¾	....	3½x5	35x5n	35x5n	W
Rainier...R-29	1	....	3⅝x5	34x3½	34x4	W
Rainier...R-26	1½	....	3⅝x5	34x3½	34x5	W
Rainier...R-28	2	....	4⅛x5¼	34x4	34x6	W
Rainier...R-20	2½–3	....	4⅛x5¼	34x4	34x7	W
Rainier...R-15	3½–5	....	4½x5½	36x5	36x5d	W
Rainier...R-17	5–6	....	4¾x6	36x6	40x6d	W
Ranger...TK-22-2	1½	2450	3¾x5	36x6n	38x7n	W
*Reo.....F	¾–1½	1245	4½x4½	34x4½n	34x4½n	B
Reliance.....10A	1½	2400	4 x5¼	36x3½	36x5	I
Reliance.....20B	2½	3100	4¼x5½	36x4	36x4d	I
Republic.....75	¾	1395b	3½x5	32x4½n	32x4½n	I
Republic.....10	1	1395	3¾x5	34x3	34x4	I
Republic...10 Exp	1	1695	3¾x5	35x5n	34x5n	I
Republic.....11X	1½	1795	3¾x5	34x3½	34x6	I
Republic.....19	2½	2195	4⅛x5¼	36x4	36x7	I
Republic.....20	3½	3095	4½x5½	36x5	36x10	I
Rowe.....CW	1½	3000	3¾x5	36x6n	36x6n	W
Rowe....C.D.W.	2	3300	4 x5	34x4	36x3½d	W
Rowe....G.S.W.	3	4150	4 x6	34x5	36x5d	W
Rowe....G.P.W.	3	5250	3¼x5r	38x7n	42x9n	W
Rowe.....HW	4	4500	4½x6	36x5	36x6d	W
Rowe....F. W.	5	5500	4½x6	36x6	40x6d	W
Ruggles.....20	1	1195	3¾x5	34x5n	34x5n	B
Ruggles.....40	2	1795	4 x5	34x5n	34x7	D
Sandow.....G	1	2295	3¾x5	34x3½	34x5	W
Sandow.....CG	1½	2590	3¾x5	34x4	34x6	W
Sandow.....J	2½	3275	4½x5½	36x4	36x7	W
Sandow.....M	3½	4295	4½x5½	36x5	36x5d	W
Sandow.....L	5	4975	4½x5½	36x6	40x6d	W
Sanford....W-15	1½	2150b	3¾x5	36x3½k	36x5k	..
Sanford.....25	2½	....	4½x5¼	36x4	36x4d	W
Sanford.....35	3½	....	4½x5½	36x5	36x5d	W
Sanford.....50	5	....	4¾x6	36x5	40x6d	W
Schacht...2-Ton	2	3200	4¼x5½	36x4	36x7	W
Schacht...3-Ton	3	3800	4¼x5½	36x5	36x5d	W
Schacht...4-Ton	4	4200	4½x6	36x5	40x5d	W
Schacht...5-Ton	5	4400	4½x6	36x5	40x6d	W
Schacht...7-Ton	7	5050	4½x6	36x6	40x7d	W
Schwartz.....A	1	1685	3½x5	34x4½n	34x4½n	B
Schwartz.....K	2	3000	3¾x5¼	34x3½	34x7	W
Schwartz.....L	3	3600	4¼x5½	36x4	36x8	W
Schwartz.....M	5	4900	4½x6	36x6	40x12	W
Selden.....30	1½	2250	3¾x5	34x3½	34x5	W
Selden.....31	1½–2½	3350	4¼x5¼	34x5	38x7	W
Selden.....50	2½	3250	4½x5¼	36x4	36x7	W
Selden.....51	2½–3½	4350	4½x5½	36x6n	40x8n	W
Selden.....70	3½–5	3750	4½x5½	36x5	36x10	W
Selden.....90	5–7	4950	4½x6	36x6	40x12	W
Seneca.....M	½	820	3½x4½	30x3½n	30x3½n	B
*Service.....12	¾	....	3¼x4½	32x4½n	32x4½n	B
*Service.....15	1¼	....	3⅜x5	34x4½n	35x5n	B
Service.....21	1½	....	3½x5½	34x3½	34x5	W
Service.....32	2	....	4 x5½	36x3½	36x7	W
Service.....37	2	....	4¼x5½	35x5n	38x7n	W
Service.....52	3	....	4¼x5½	36x4	36x8	W
Service.....72	3½	....	4¼x5½	36x5	36x5d	W
Service.....77	4	....	4½x6	36x5	36x5d	W
Service.....102	6	....	4½x6	36x6	40x6d	W
Signal.....NF	1	1950	3¾x5	34x5n	36x6n	W
Signal.....H	1½	2450	4½x5¼	34x4	36x6	W
Signal.....J	2½	2875	4½x5¼	34x4	36x8	W
Signal.....M	3½	3675	4½x5½	36x5	40x5d	W
Signal.....R	5	4400	4¾x6	36x6	40x6d	W
Southern.....10	1	2090	3¾x5	34x3½	34x4	W
Southern.....15	1½	2590	3¾x5½	36x6n	34x4	W
Southern.....20	2	2990	4⅛x5¼	36x6n	40x8k	W
Standard....1-K	1½	1600	3¾x5	34x3½k	34x5k	W
Standard....76	2½–3	2400	4½x5¼	36x4k	36x7k	W
Standard....66	3½–5	3150	4½x5½	36x5	36x10	W
Standard....5-K	5–7	4400	4¾x6	36x6	40x12	W
Sterling.....1½	1½	2885	4 x5¼	36x3½k	36x5k	W
Sterling.....2	2	3085	4 x5¼	36x4k	36x6k	W
Sterling.....2½	2½	3290	4⅜x5¾	36x4k	36x4dk	W
Sterling.....3½	3½	4325	4½x6¼	36x5k	40x5dk	W
Sterling.....5-W	5	4950	5 x6¼	36x6	40x6d	W
Sterling.....5-C	5	5500	5 x6¼	36x6	40x6d	C
Sterling.....7½	7½	6000	5 x6¼	36x6	40x7d	C
*Stewart.....14	¾	1245	3⅝x5½	32x4½n	32x4½n	I
Stewart.....15	1	1445	3⅝x5⅛	35x5n	35x5n	I
Stewart.....9	1½	1790	3¾x5	34x3½	34x5	I
Stewart.....7	2	2190	4⅛x5¼	34x4	34x7	I
Stewart.....7-X	2½	2390	4¼x5½	34x4	34x7	I
Stewart.....10	3½	3190	4½x5½	36x5	36x5d	I
Stewart.....10-X	3½	3190	4½x6	36x5	36x5d	I
*Stoughton.....C	¾	1240	3½x5	34x4½n	34x4½n	W
Stoughton.....A	1	1790	3¾x5¼	34x5	34x5	W
Stoughton.....B	1½	2150	3¾x5¼	36x3½	36x5	W
Stoughton.....D	2	2490	4 x5¼	36x4	36x7	W
Stoughton.....F	3	3150	4¼x5½	36x5d	36x5d	W
Sullivan.....E	2	2800	4¼x5½	36x4k	36x7k	W
Sullivan.....H	3½	3750	4½x6	36x5	36x5d	W
*Thomart.....C	1¼	1795a	4 x5¼	34x5	34x5	C
Tiffin.....GW	1½	2100	4½x5¼	36x3½	36x5	W
Tiffin.....MW	2½	2700	4½x5¼	36x4	36x3½d	W
Tiffin.....PW	3½	3600	4½x5½	36x5	40x5d	W
Tiffin.....F50	5	4300	4¾x6	36x6	40x6d	W
Tiffin.....F60	6	$4500	4¾x6	36x6	40x12	W
Titan.....	2	2950	4x5½	34x4k	36x7	I
Titan.....	3½	3950	4¼x5½	36x5	40x10	I
Titan.....	5	4550	4½x6	36x5	40x6d	I
Titan.....6-Ton	6	5150	4½x6	36x5	40x12	I
Tower.....J	1½	2900	4⅛x5¼	35x5	38x7	W
Tower.....H	2½	3200	4⅛x5¼	36x4	36x7	W
Tower.....G	3½	4100	4½x5½	36x5	36x5d	W
Traffic.....	1½	1595	3¾x5	35x5n	35x5n	I
Traffic.....C	2	1595	3¾x5	34x3½k	34x5k	I
Traffic.....	3	1895	3¾x5	36x4	36x7	I
*Transport.....15	1	1295a	3¾x5	32x4½n	32x4½n	B
Transport.....25	1½	1495	3¾x5⅛	34x3½k	34x4k	I
Transport.....35	2	1885	3¾x5	36x3½k	36x6k	I
Transport.....55	3	2385	4½x5¼	36x4k	36x8k	I
Transport.....60	3½	2585	4½x5½	36x4k	36x8k	I
Transport.....75	5	3485	4½x6	36x5k	36x12k	I
Traylor.....B	1½	2390	3¾x5⅛	34x3½	34x5	W
Traylor.....C	2–2½	2850	4 x5½	36x4	36x7	W
Traylor.....D	3–3½	3300	4¼x5½	36x4	36x8k	W
Traylor.....F	5–6	4700	4½x6	36x6	40x6d	W
*Triangle.....AA	1	1285	3¼x5	34x4½n	34x4½n	I
Triangle.....A	1½–2	1985	3¾x5¼	34x3½k	34x6k	I
Triangle.....C	2–2½	2285	3¾x5¼	36x4k	36x6k	I
Triangle.....B	2½–3	2585	4 x5¼	36x4k	36x7k	I
Triumph.....G	1	1995	3⅜x5⅛	34x3½	34x5n	W
Triumph.....HC	1½	2550	3¾x5¼	36x3½	36x5	W
Triumph.....HB	2	2900	3¾x5¼	36x4	36x7	W
Twin City...B.W.	2	2750	4 x5½	36x6	40x8	I
Twin City...A.W.	3½	3950	4½x6	36x5	40x5d	W
5Twin City.....B	3½	....	5⅜x6	36x6	36x6	I
5Twin City.....A	5	....	5⅜x6	36x7	36x7	J
Ultimate.....A	2	3150	4 x5½	36x3½	36x6	W
Ultimate.....AJ	2	3200	4½x5½	36x3½	36x6	W
Ultimate.....AJL	2	3250	4½x5½	36x3½	36x6	W
Ultimate.....B	3	3700	4½x5½	36x4	36x4d	W
Ultimate.....BL	3	3800	4½x5½	36x4	36x4d	W
Ultimate.....D	5	5500	5 x6½	36x6	40x12	W
Union.....FW	2½	3490	4 x6	36x5k	36x5k	D
Union.....HW	4	4650	4½x6	36x6	40x12	D
Union.....JW	6	5860	5 x6	36x6	40x14	D
United.....A	1½	2445	3¾x5¼	36x3½k	34x5k	W
United.....B	2½	3150	4½x5½	36x4k	36x7k	W
United.....C	3½	3975	4½x5½	36x5	36x5d	W
United.....V	5	4500	4½x6	36x6	40x6d	W
*United States..U	1	1875	3⅝x5⅛	34x5n	34x5n	B
UnitedStates,NW	1½	2225	3¾x5	36x5	36x5½	W
United States...N	1½	1975	3¾x5	36x3½k	36x5k	I
United States...R	3	3075	4 x5¼	36x4	36x4d	W
United States...S	4	3875	4½x5½	36x5	36x5d	W
United States...T	6	4850	4¾x6½	36x6	40x6d	W
Velie.....46	1½	1585	3¾x5	36x3½k	36x5k	I
Veteran....M**	1½	2699	3¾x5¼	35x5n	35x5n	W
Veteran....P**	2	3699	4¼x5½	36x4	36x7	W
Veteran....R**	3	4200	4¾x5½	36x4	36x7	W
Veteran....S**	4	5395	4½x6	36x6	36x10	W
*Vim.....29	½	1050	3½x4½	31x4n	31x4n	W
Vim.....30	1½	1175	3½x4½	32x4½	32x4½	W
Vim.....31	1	1975	3⅜x5⅛	25x5n	35x5n	W
Vim.....22	2	3150	3⅜x5⅛	36x4	36x6	W
Vim.....23	3	3950	4¼x5½	36x5	36x5d	W
Walker-JohnsonA	2	2250	3¾x5	34x3½	34x6	W
Walker-JohnsonB	3	2750	4¼x5½	36x4	36x8	W
Walter.....S	5	4850	4½x6½	36x6	40x6d	W
Ward-LaF....2B	2½	2990	4⅜x5¾	36x4	36x4d	W
Ward-LaF....4A	3½	3990	4½x6½	36x5	36x5d	W
Ward-LaF....5A	5	4590	5 x6¼	36x6	40x6d	W
*Watson.....B	1	1865a	3¾x5¼	35x5n	35x5n	W
Watson.....N	3½	4250	4½x5½	36x5	36x10	W
Western....W1½	1½	2550	4½x5¼	36x3½k	36x5k	W
Western....L1½	1½	2550	3¾x5	36x3½k	36x5k	W
Western....W2½	2½	3250	4⅛x5¼	36x4	36x7	W
Western....L2½	2½	3250	4¼x6	36x4	36x7	W
Western....W3½	3½	4250	4½x6	36x5	40x5d	W
*White.....15	¾	2400	3⅜x5⅛	34x5n	34x5n	B
White.....20	2	3250	3¾x5⅛	36x4k	36x7	D
White.....40	3½	4200	3¾x5¾	36x5	40x5d	D
White.....45	5	4500	4¼x5¾	36x6	40x6d	D
White Hick....E	1	1225	3¾x5	34x5n	34x5n	W
White Hick....H	1½	1375	3¾x5	36x3½	36x5	W
White Hick....K	2½	1675	4⅛x5¼	36x4	36x5	W
Wichita.....K	1	1875	3¾x5¼	36x3½	36x4k	W
Wichita.....M	2	2400	3¾x5¼	36x3½k	36x6k	W
Wichita.....RX	3	3200	4⅜x5¾	36x4k	36x8k	W
Wichita.....O	4	3500	4½x6¼	36x5k	36x5k	W
Wilcox.....AA	1	1900	3¾x5½	36x4k	36x4k	W
Wilcox.....BB	1½	2550	4¼x5	36x4	36x5	W
Wilcox.....D	2½	3000	4¼x5	36x4k	36x3½dk	W
Wilcox.....E	3½	3950	4½x6	36x5k	36x5dk	W
Wilcox.....F	5	4350	4⅜x6½	36x5	40x6d	W
Wilson.....F	1½	2270	3¾x5	36x3½	36x5	W
Wilson.....EA	2½	2825	4⅛x5¼	36x4	36x7	W
Wilson.....G	3½	3685	4½x5½	36x5	36x5	W
Wilson.....H	5	4520	4⅜x6	36x6	40x6	W
*Wisconsin.....A	1	1750	3¾x5	34x5n	34x5n	W,B
Wisconsin.....B	1½	2100	3¾x5	35x5	36x6	W
Wisconsin.....C	2½	2700	4 x5¾	36x6n	36x7	W
Wisconsin.....D	3½	3000	4⅜x5¾	36x6n	40x8	W
Wisconsin.....E	5	3500	4½x6¼	36x6	36x10	W
Wisconsin.....F	7	4000	5 x6¼	36x6	36x12	W
Witt-Will.....N	1½	2250	3¾x5	36x3½k	36x5k	W
Witt-Will.....P	2½	2750	4⅛x5¼	36x3½k	36x7k	W
Wolverine.....J	1	2125	3½x5	34x3	34x4	I
Wolverine.....J	1½	2375	3¾x5	34x3½	34x5	I
Wolverine.....J	2	2640	3¾x5	34x4	34x7	I
Wolverine.....J	2½	3425	4½x5¼	36x5	36x10	I
Wolverine.....L	3½	4100	4½x5½	36x5	36x10	I

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm.
r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment. b—price includes body. *—speed truck or delivery wagon. **—Canadian Make. trac.—tractor.

3—Moreland Road Runner, 4—Nelson Le Moon. 5—Twin City Four Wheel Drive.

Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
Allis-Chal.G.P	6-12	$250	2	LeR.	4-3 1/16x4 1/2	Gas.	1
Allis-Chalm..B	6-12	325	2	LeR.	4-3 1/16x4 1/2	G	1
Allis-Chalm...	15-25	1185	4	Midw.	4-4 1/2x5 1/4	Gas.	3
Allis-Chalm...	20-35	1885	4	Own	4-4 3/4x6 1/2	GorK	3-4
‡Allis-Chalm..	20-35	2085	4	Own	4-4 3/4x6 1/2	G	4
Allwork...2-G	14-28	1695	4	Own	4-4 3/4x6	GorK	3
Allwork.....C	14-28	1395	4	Own	4-5 x6	GorK	3
AndrewsKin.D	18-36	2500	4	Clim.	4-5 x6 1/2	GorK	4
ARO..1921-22	3-6	385	4	Own	1-4 1/2x5	Gas.	1
Aultman-T....	15-30	2200	4	Clim.	4-5 x6 1/2	G,K	4
Aultman-T....	22-45	3420	4	Own	4-5 1/2x8	G,K	6
Aultman-T....	30-60	4500	4	Own	4-7 x9	G,K,D	8-10
Automot. B-3	12-24	1250	4	Herc.	4-4 x5 1/8	Gas.	2-3
Avery,SR.Cul.	5-10	....	4	Own	4-3 x4	G,K	..
Avery..Cult-C	....	....	3	Own	6-3 x4	G,K	..
Avery.....B	5-10	....	4	Own	4-3 x4	G,K	2
Avery.....C	....	....	4	Own	6-3 x4	G,K	..
Avery.....	8-16	....	4	Own	2-5 1/2x6	G,K,D	2-3
Avery.....	12-20	....	4	Own	4-4 1/2x6	G,K,D	3-4
Avery.....	12-25	....	*	Own	4-4x5 1/2	G,K,D	3
Avery.....	12-25	....	4	Own	2-6 1/2x7	G,K,D	3-4
Avery.....	14-28	....	4	Own	4-4 5/8	G,K,D	3-4
Avery.....	18-36	....	4	Own	4-5 1/2x6	G,K,D	4-5
Avery.....	25-50	....	4	Own	4-6 1/2x7	G,K,D	5-6
Avery.....	45-65	....	4	Own	4-7 3/4x8	G,K,D	8-10
Bates Mule .H	15-25	....	4	Midw	4-4 1/2x5 1/4	Gas.	3
Bates Mule..F	18-25	....	*2	Midw	4-4 1/2x5 1/4	Gas.	3
‡Bates MuleG	25-35	....	*2	Midw	4-4 1/2x6	Gas.	..
Beeman,....G	2-4	240	4	Own	1-3 1/2x4 1/2	Gas.	..
Best.....	18-30	3100	*2	Own	4-4 3/4x6 1/2	G,K,D	4
Best.....	60	5450	*2	Own	4-6 1/2x8 1/2	G,K,D	8-9
Boring...1921	....	1850	3	Wauk	4-4 3/8x5 3/4	GorK	2
Burn-Oil, 1922	15-30	1435	4	Own	2-6 3/4x7	Ker.	3-4
Capital.....	15-30	1000	2	Own	4-4 1/4x6	Gas.	3
Case.....	10-18	700	4	Own	4-3 1/2x5	GorK	2
Case.....	12-20	1050	4	Own	4-4 1/2x5	G,K,D	3
Case.....	15-27	1320	4	Own	4-4 1/2x6	GorK	3-4
Case.....	22-40	2550	4	Own	4-5 1/2x6 3/4	GorK	4-5
Case ...40-72	40-72	5200	4	Own	7 x8	G,K,D	8-10
Caterpillar .5T	25	....	*2	Own	4-4 3/4x6	Gas.	4
Caterpillar 10T	40	....	*2	Own	4-6 1/2x7	Gas.	6
Caterpillar T35	15-25	....	2	Own	4-4 x5 1/2	Gas.	..
Centaur.....	5-2 1/2	345	2	N Way	2-4 1/2x4 1/2	GorK	*
Chicago....40	40	2500	4	Own	4-4 1/2x6	Gas.	4
Cletrac.....F	9-16	595	*2	Own	4-3 1/4x4 1/2	G,K,D	2
Cletrac.....W	12-20	1345	*2	Own	4-4 x5 1/2	G,K,D	2-3
Dakota.....4	15-27	1500	3	Dom,	4-4 3/4x6	Gas.	3
Depue.....A	20-30	2500	4	Buda	4-4 1/2x6	Gas.	4
Dill.....D	20	2380	4	Cont.	4-4 1/2x5 1/2	Gas.	3
Dill.....R.W.	20	2980	4	Midw.	4-4 1/2x6	Gas.	3
Do-It-All....A	3-6	495	..	Own	1-4 1/2x5	Gas.	1
Eagle.....F	12-22	....	4	Own	2-7 x8	GorK	3-4
Eagle.....H	16-30	....	4	Own	2-8 x8	G or K	4-5
E-B.....AA	12-20	1095	4	Own	4-4 3/4x5	G,K,D	3
E-B.....Q	12-20	750	4	Own	4-4 3/4x5	G,K,D	3
E-B.....	16-32	1750	4	Own	4-5 1/4x7	G,K,D	4
Fageol.....D	9-18	1525	4	Lyc.	4-3 1/2x5	Gas.	?
Farm Horse.B	18-30	1885	4	Clim.	4-5 x6 1/2	G,K	..
Farquhar....	15-25	....	4	Buda	4-4 1/2x6	G,K,D	3
Farquhar.....	18-35	....	4	Own	4-6 x8	G,K,D	4-5
Farquhar.....	25-50	....	4	Own	4-7 x8	G,K,D	6-7
Fitch..4 Drive	20-35	1850	4	Clim.	4-5 x6 1/2	GorK	3-4
Fordson.....	-18	$ 395	4	Own	4-4x5	G,K	2
Fox.....E	20-40	2390	4	Own	4-5 1/2x7 1/2	G or K	4
Franklin....G	18-30	4000	*2	Clim.	4-5 x6 1/2	G or K	3-4
Franklin....C	18-30	3350	*2	Clim.	4-5 x6 1/2	G or K	3-4
Franklin...G2	18-30	4350	2	Clim.	4-5 x6 1/2	G or K	3-4
Frick.....A	12-20	....	4	Erd.	4-4 x6	G,K	2-3
Frick.....C	15-28	....	4	Beav.	4-4 3/4x6	G,K	3-4
Grain Belt...A	18-36	2150	4	Wauk.	4-4 3/4x6 3/4	G or K	4
Gray.....1920	18-36	....	3	Wauk	4-4 3/4x6 3/4	Gas.	4
Gt. Western St	20-30	1950	4	Beav.	4-4 3/4x6	K	4
Hart-Parr..20	20	945	4	Own	2-5 1/4x6 1/2	K,D.	2
Hart-Parr..30	30	1295	4	Own	2-6 1/2x7	K,D.	3
‡Hart-Parr.....	....	1695	4	Own	6 1/2x7	K.D.	..
Heider.....D	9-16	870	4	Wauk	4-4 1/4x5 3/4	G,K	2
Heider.....C	12-20	995	4	Wauk	4-4 1/2x6 3/4	G,K	3
Heider....Cult	5-10	800	4	LeR.	4-3 1/2x4 1/2	Gas.	1
Huber Light 4.	12-25	1185	4	Wauk	4-4 1/2x5 3/4	G or K	3
Huber Super 4	15-30	1885	4	Midw	4-4 1/2x6	Gas	3
Illinois,.....C	15-30	....	4	Clim.	4-5 x6 1/2	G,K	4
Imperial....E	40-70	4500	4	Own	4-7 1/2x9	G,K,D	10
Indiana.....F	5-10	665	2	LeR.	4-3 1/2x4 1/2	Gas.	1-2
International.	8-16	†670	4	Own	4-4 1/4x5	G,K,D	2
Internatl.Titan	10-20	†700	4	Own	2-6 1/2x8	G,K,D	3
International..	15-30	1750	4	Own	4-5 1/4x8	G,K,D	4
J-T,.....N	20-40	....	*2	Clim.	4-5x6 1/2	G,K,D	3-4
Lauson.....5	12-25	1495	4	Midw	4-4 1/2x5 1/4	Gas.	3
Lauson.....20	15-25	1495	4	Beav.	4-4 1/2x6	G or K	3-4
Lauson.....21	15-30	1875	4	Beav.	4-4 3/4x6	G or K	3-4
‡Lauson Road	15-30	2100	4	Beav.	4-4 3/4x6	K	..
Leader.....B	12-18	685	4	Own	2-6 x6 1/2	G,K,D	2-3
Leader.....N	16-32	1725	4	Clim.	4-5 x6 1/2	G,K	3-4
‡Leader...GU	18-35	2150	*2	Clim.	4-5 x6 1/2	G,K	3-4
Linn.....H4J	40-	4500	*	Cont	4-4 1/2x5 1/2	Gas	4
Linn.....W	60	5000	*	Wauk	4-5 x6 1/4	Gas	6
Little Giant,.B	16-22	2200	4	Own	4-4 1/2x5	K	4
Little Giant,.A	26-35	3300	4	Own	1-5 1/2x6	K	6
Lombard.1922	85-150	8950	*2	Wisc.	6-5 1/2x6 3/4	Gas.	16
Lombard.1922	50	5300	*2	Wisc.	4-4 3/4x6 1/2	Gas.	6-10
Master Jr.....	5-10	585	..	LeR.	-2 3/4x4	Gas.	1
MerryGar1922	2	210	2	Evin	1-2 5/8x2 1/2	Gas.	..
Minne...All-P	12-25	800	4	Own	4-4 1/2x7	G or K	3
Minne. Gen.P	17-30	1600	4	Own	4-4 3/4x7	G or K	3-4
Minne. Med.D	22-41	2650	4	Own	4-6 x7	G or K	5-6
MinneHeavyD	35-70	3850	4	Own	4-7 1/2x9	G or K	8-9
Mohawk .1922	8-16	650	2	Light	4-3 1/4x4 1/2	K or G	1-2
Moline Univ D	9-18	....	2	Own	4-3 1/2x5	Gas.	2-3
Moline Orch..	9-18	....	2	Own	4-3 1/2x5	Gas.	2-3
Motor Macult.	1 1/2	195	2	Own	1-2 3/4x3 1/2	Gas.	..
NB.....1	3-6	425	4	Own	2-3 3/4x4	Gas.	1
Nichols-Shep.	20-42	2650	4	Own	8 x10	G or K	3-6
Nichols Shep.	25-50	3000	4	Own	9 x12	G or K	4-7
Nilson Senior..	20-40	1975	5	Wauk	4-5 x6 1/4	G,K	4
Oil Pull.....K	12-20	....	4	Own	2-6 x8	K,D	3
Oil Pull.....H	16-30	....	4	Own	2-7 x8 1/2	K,D	4
Oil Pull ....G	20-40	....	4	Own	2-8 x10	K,D	5-6
Oil Pull.....E	30-60	....	4	Own	2-10x12	K,D	8-10
Oldsmar GarK	2 1/2-5	225	4	Own	1-5 1/8x5 1/2	Gas.	1
Oshkosh....M	6-12	650	2	Own	2-4 x6	G.K	1
Oshkosh....G	12-24	935	2	Own	2-6 x7	G,K	3
Peoria.....L	12-25	$1600	4	Clim.	4-5 x6 1/2	G,K	3
Pioneer.....G	18-36	1750	4	Own	4-5 1/2x6	G,K,D	4
Pioneer.....C	40-75	3550	4	Own	4-7 x8	Gas.	10
Plowman....A	15-30	1295	4	Buda	4-4 1/2x6	G,K	3-4
Reliable.....	10-20	390	4	Own	2-6 x7	Ker.	2
Rex.....	12-25	1600	4	Wauk	4-4 1/4x5 3/4	G or K	3
Russell.....	12-24	1500	4	Own	4-4 1/4x5 3/4	G or K	2-3
Russell.....	15-30	2200	4	Own	4-5 x6 1/2	G or K	3-4
Russell.....	20-35	3000	4	Own	4-5 1/2x7	G or K	4-5
Russell.....	30-60	5000	4	Own	4-8 x10	G or K	8-10
Samson....M	.....	445	4	Own	4-4 x5 1/2	G,K	2
Sandusky,...J	10-20	1250	4	Own	4-4 1/4x5 1/4	G,K,D	2
Sandusky...E	15-35	1750	4	Own	4-5 x6 1/2	G,K,D	4
Shelby.....D	15-30	....	4	Beav.	4-4 3/4x6	G,K	3
Shelby.....C	9-18	....	4	Wauk	4-3 3/4x5 1/4	G or K	2
Steady Pull..	12-24	1485	4	Own	4-4 x5	Gas.	3
Stinson....4E	18-36	1835	4	Beav.	4-4 3/4x6	G,K	4
Tioga.....3	18-32	....	4	Wisc.	4-4 1/2x6	Gas.	3-4
Topp-Stewart.	30-45	....	4	Wauk	4-4 3/4x6 3/4	Gas.	3-4
Toro Cultivator	6	750	3	LeR	4-3 1/2x4 1/2	Gas.	2
ToroTractor'22	6-10	495	3	LeR	4-3 1/2x4 1/2	Gas.	2
Townsend.....	10-20	800	2	Own	4-6 1/2x7	Ker.	2-3
Townsend.....	15-30	1350	2	Own	4-7 x8	Ker.	3-4
Townsend.....	25-50	2500	2	Own	4-8 1/2x10	Ker.	4-8
Traction Motor	40-50	....	4	....	8-3 1/2x5	Gas.	4-5
Trayler....TB	6-12	500	4	LeR.	4-3 1/2x4 1/2	Gas.	1-2
Trundaar....10	25-40	3750	*2	Wauk	4-5 x6 1/4	G or K	4
Twin City.....	12-20	1200	4	Own	4-4 1/4x6	G,K	3
Twin City.....	20-35	2750	4	Own	4-5 1/2x6 3/4	G,K	5-6
Twin City.....	40-65	4750	4	Own	4-7 3/4x9	G,K	8-10
Uncle Sam C20	12-20	1295	4	Weid.	4-4 x5 1/2	G	2-3
Uncle Sam B19	20-30	1985	4	Beav.	4-4 3/4x6	G or K	3-4
Uncle Sam D21	20-30	1895	4	Beav.	4-4 3/4x6	G or K	3-4
Utilitor....501	2 1/2-4	295	4	Own	1-3 1/2x4 1/2	G	1
Vim.....B	15-30	1190	4	Wauk	4-4 3/4x5 3/4	G,K	3
Wallis.....K	15-25	†995	4	Own	4-4 1/4x5 3/4	G,K	3
Waterloo....N	12-25	675	4	Own	2-6 1/2x7	Ker.	3
Wetmore21-22	12-25	1185	4	Wauk	4-4 x5 3/4	G,K	3
Whitney....D	9-18	595	4	Own	2-5 1/2x6 1/2	Gas.	2
Wichita.....T	15-30	2000	4	Beav.	4-4 1/2x6	G,K,D	3-4
Wisconsin...E	16-30	1850	4	Clim.	4-5 x6 1/2	G or K	3
Wisconsin...F	20-40	2050	4	Wauk	4-5 x6 1/4	G or K	4
Wisconsin,..H	22-40	2550	4	Clim.	4-5 1/2x7	G or K	4-6
Yuba....12-20	12-20	2400	*2	Wisc.	4-4 1/2x6 3/4	G,K,D	3
Yuba....15-25	15-25	2750	*2	Wisc.	4-4 1/4x6	G,K,D	..
Yuba....20-35	20-35	3900	*2	Wisc.	4 5 3/4x7	G,K,D	4
Yuba....25-40	25-40	4250	*2	Wisc.	4-5 3/4x7	G,K,D	..
‡Yuba.....	25-40	4750	*2	Yuba	4-5 1/4x7	D	..
Zelle.....	12-25	....	4	Buda	4-4 1/4x5 1/2	G or K	3

ABBREVIATIONS: G—Gasoline. K—Kerosene. D—Distillate. Plow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make: Beav.—Beaver. Clim.—Climax. Cont.—Continental. Dom.—Domas. Evin.—Evinrude. Herc.—Hercules. LeR.—LeRoy. Midw.—Midwest. Nway.—New Way. Nor.—Northway. T.C.—Twin City. Wauk.—Waukesha. Weid.—Weidely. Wis.—Wisconsin *—Crawler type All others are wheel type. §Track Runner. ‡Industrial Tractor. †Price includes plows.

Large Sales in New York in May; June Indications Good

Some Dealers Selling Established Cars Report Best Business They Ever Had

NEW YORK, May 30—May has been one of the biggest sales and delivery months in the history of the automobile business in New York.

Actual comparison figures for the entire trade are not available but virtually in all branches and distributor establishments both wholesale and retail business ran ahead of March and April, which were strong business months, and representatives of several cars report the largest months they ever had.

With the more popular cars, inability to obtain prompt deliveries has held down both sales and deliveries, but a good many of these orders have not been lost to the industry, having been turned toward cars of the prospects' second or third choice.

Compilers of registration figures while unable to furnish complete figures anticipate that registration of new passenger cars in ten counties in and around New York will exceed 10,000, as compared with approximately 9,200 in April and 7,000 in March.

Demand has held strong throughout the spring for enclosed cars, of which there has been a shortage in several lines.

Indications for June business, with the July 4 holiday in the offing, are decidedly bright.

Truck sales have been picking up steadily. The lighter lines are running strong and there has been a gradual but steady increase in the sales of heavy duty carriers.

GORDON LEE TO ADDRESS A. E. A.

Chicago, May 29—The Automotive Equipment Assn. announces that one of the speakers at the association's convention at Colorado Springs, June 19, will be Gordon Lee, Chief of the Automotive Division of the Foreign Trade Bureau of the Department of Commerce.

NEW BETHLEHEM TRUCK MODELS

New York, May 27—The new Bethlehem Motors Corp. announces that it is now producing trucks in three models. The list follows:

KN	1 ton	$1195
GN	2 ton	1595
HN	3 ton	3195

TO FINANCE DUNLOP CO.

Buffalo, May 29—F. A. Szarvasy, chairman of the board of the Dunlop Rubber Co., Ltd., is on his way from England to arrange new financing for the American Dunlop Rubber Co.